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ABSTRACT

This instructional package contains materials for four 1-hour lessons to train current and future auto body repairers and auto mechanics in proper safety and health protection measures. The materials are designed to be incorporated into training and/or recertification courses at high schools, trade schools, and community colleges. Included in the package are a teacher's guide, teaching curriculum, handouts, worksheets, and transparencies. The teacher's guide describes the program and explains how to incorporate the lesson plans into existing auto body and repair curricula. The curriculum guide contains lesson plans for sessions on the following topics: understanding the special hazards associated with cigarette smoking in or near auto body and repair shops and protecting against the dirty air in a shop; inspecting an auto body and repair shop for breathing hazards; protecting individuals' health in an auto body and repair shop through training; and protecting individuals' health in an auto body and repair shop through problem solving. Each lesson plan contains objectives and session activity outlines. Included in each outline are instructions for conducting the activity, health messages to relate during the activity, and a list of accompanying materials/notes. (MN)

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Future Workers' Education Project

Auto Body and Repair

American Lung Association

1990

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AMERICAN LUNG ASSOCIATION®
The Christmas Seal People®

Dear Teacher:

The Future Workers' Education Project, Auto Body and Repair Unit contains the following five components:

- **A TEACHER'S GUIDE:**
  Describes the project, explains how to use the lesson plans, and how to make the project a continuing part of the yearly curriculum. (Item #2158)

- **A FOUR-SESSION TEACHING CURRICULUM:**
  Contains questions to generate discussion, health messages and detailed instructions on how to carry out each session. A glossary is found at the end of the Curriculum. (Item #2159)

- **HANDOUTS:**
  This packet contains master copies of each handout which you should photocopy. Please make note of the list of handouts in the "HANDOUTS" envelope (see below):

No.	Name	Item No	Student's Version	Teacher's Version	Number of Pages
1	What's Wrong With This Picture?	2160-1			1
2A	Story of Beth	2160-2A			1
2B	Story of Ray	2160-2B			1
3	Sample Worksite Smoking Policy	2160-3			1
4	The Major Breathing Hazards In The Auto Body And Repair Shop	2160-4S	X		3
4	The Major Breathing Hazards In The Auto Body And Repair Shop	2160-4T		X	4
5	Checklist For Health And Safety In The Auto Body And Repair Shop	2160-5			1
6	What To Look For On A Warning Label	2160-6			1
7	How To Read A Material Safety Data Sheet	2160-7			2
8	Sample Material Safety Data Sheet	2160-8			2
9	Six Facts You Must Know About Respirators	2160-9			1
10A	Attitudes That Help	2160-10A			1
10B	Attitudes That Hinder	2160-10B			1
11	What To Do If You Think You're Being Exposed To A Breathing Hazard At Work	2160-11			1

Future Workers' Education Project Components (cont'd.)

- **WORKSHEETS:**
  This packet contains master copies of each worksheet. Again you will need to copy enough for the students in your class. Below is the list of all worksheets in the "WORKSHEETS" envelope:

No.	Name	Item No	Student's Version	Teacher's Version	Number of Pages
1	Worksite Smoking Policy	2161-1			1
2A	Find The Breathing Hazards In The Auto Body Shop	2161-2A			1
2B	Find The Breathing Hazards In The Auto Repair Shop	2161-2B			1
3	Chemical Warning Label	2161-3			1
4	Material Safety Data Sheet	2161-4S	X		1
4	Material Safety Data Sheet	2161-4T		X	1
5A	Scenario 1	2161-5A/S	X		1
5A	Scenario 1	2161-5A/T		X	1
5B	Scenario 2	2161-5B/S	X		1
5B	Scenario 2	2161-5B/T		X	1
5C	Scenario 3	2161-5C/S	X		1
5C	Scenario 3	2161-5C/T		X	1
5D	Scenario 4	2161-5D/S	X		1
5D	Scenario 4	2161-5D/T		X	1

- **TRANSPARENCIES:**
  There are two which are used in Session Three.

No.	Name	Item No
1	Federal Hazard Communication Standard	2162-1
2	Additional Worker Rights	2162-2

Extra handouts, worksheets and transparencies can be ordered as a package: they are not sold separately.

We hope you enjoy using the Future Workers' Education Project and that it helps you in your efforts to teach students how they can have safer and healthier lives.

Contact your local American Lung Association® for any additional information you may want about workplace hazards.

Future Workers' Education Project

AMERICAN
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Teacher's Guide

Auto Body and Repair

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Acknowlegements

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Square D Company
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David W. Cugell, M.D.,Chair
Professor of Medicine
Director, Pulmonary Function Laboratory
Northwestern Memorial Hospital
Chicago, Illinois

Brian Boehlecke, M.D.
Associate Professor of Medicine
University of North Carolina at Chapel Hill
Chapel Hill, North Carolina

Molly Clark, MPH
Environmental Health Associate
Rhode Island Lung Association
Providence, Rhode Island

Jan H. Cortez, MPH
Director, Occupational and Environmental Health Programs
American Lung Association of San Diego & Imperial Counties
San Diego, California

Marcia Pinkett-Heller, MPH
Associate Professor of Health
Department of Health Sciences
Jersey City, New Jersey

David Ortleib
Director, Health and Safety Department
International Chemical Workers Union
Akron, Ohio

Nancy Raynor, R.N., M.Ed.
Chief Consultant
Health Occupations Education
North Carolina Department of Public Instruction
American Vocational Association, Health Occupations Education
Vice President
Raleigh, North Carolina

Jeanne Stellman, Ph.D.
Women's Occupational Health Resource Center
Brooklyn, New York

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I. Introduction

Each year thousands of workers in the United States develop a lung disease such as asthma, asbestosis, or cancer that is directly related to their work environment. According to the National Institute for Occupational Safety and Health (NIOSH) lung disease ranks number one in the list of work-related diseases and injuries in the nation. Occupational lung disease can affect a worker's ability to function on a daily basis, increase family financial and emotional stress, and lead to permanent disability and early death. Yearly, over 16,000 lung cancer deaths alone are attributable to inhaling carcinogens at work.

Given the extent and seriousness of this problem, the American Lung Association has developed the Future Workers' Education Project.

Educational Objectives

The Future Workers' Education Project (FWEP) is designed to integrate a lung health and safety component into the vocational curriculum of the nation's secondary schools, vocational high schools and training institutions.

The purpose of the Project is to provide young people who are about to enter the workplace (Future Workers) with the knowledge, skill and understanding that will enable them to act on behalf of themselves and others to prevent or minimize exposure to lung hazards.

The objectives for FWEP are based on the identification of critical tasks necessary to maintain lung health in the workplace. The critical tasks were identified by a panel of experts in lung health and vocational education organized by the American Lung Association. Objectives are met by carrying out specific activities that enhance critical thinking skills in five areas: 1) observation; 2) evaluation; 3) decision-making; 4) communication and 5) advocacy.

Audience

The audience for FWEP consists of 14 million young people studying in over 26,000 high schools, vocational high schools or other vocational institutions around the country. These students are enrolled in vocational and technical courses that may lead to jobs which are at high risk for exposure to lung hazards including airborne carcinogens.

Rationale

Every day young people enter a wide variety of fields such as agriculture, cosmetology, auto repair, carpentry and welding without full knowledge of the short- and long-term health effects of these jobs.

The American Lung Association believes that we can help create a more knowledgeable and cautious work force by educating young people about lung hazards before they enter the workplace. It is while students are actively involved in the learning process, and still developing lifelong health habits, that a curriculum on how to prevent lung disease is likely to have its greatest impact.

We believe the Future Workers' Education Project will have a significant effect on the quality of life for the next generation of American workers.

Program Components

The FWEP consists of a set of four, forty-five minute sessions on lung health and safety in the workplace. Each session contains activities that are designed to help vocational teachers meet the competency-based teaching objectives for safety and health in the shop for grades 10 through 12.

The program is available for each of six specific trades or vocations: 1) Agriculture; 2) Auto Body and Repair; 3) Carpentry; 4) Cosmetology; 5) Health Occupations; and 6) Welding. Each program contains materials required to carry out the sessions such as: transparencies, handouts, worksheets, and a list of additional supplies needed.

Teaching Methods and Activities

Teachers use group discussion to help students identify breathing hazards specific to their trade, and find solutions to minimize exposure to them. Activities that can be carried out in the shop, or in simulation increase students' confidence and enable them to master new information and skills. These include:

- Provision of trade/job specific information about lung hazards by the teacher
- Modeling of new skills by teacher
- Practice to rehearse new skills in life-like situations
- Use of handouts and worksheets to reinforce new information

Session Topics for Auto Body and Repair

Session 1. Cigarette Smoking Is Hazardous — Especially in the Auto Body and Repair Shop helps students identify the special health and safety hazards associated with smoking at work. Students brainstorm about ways to reduce these hazards and debate the value of a worksite smoking policy that protects the health of all workers.

Session 2. How to Inspect an Auto Body and Repair Shop for Breathing Hazards helps students generate a list of concrete ways to identify breathing hazards. A worksite inspection helps students recognize hazards specific to their job, and concludes with a discussion on methods of protection.

Session 3. Protecting Yourself in the Auto Body and Repair Shop Through Training focuses on rights to training and information provided to workers under the OSHA Federal Hazard Communication Standard. Students are trained to correctly read a warning label, and a Material Safety Data Sheet on chemicals commonly found in the auto body and repair shop. Students are also provided with basic information on respirators common to the auto body and repair shop.

Session 4. Protecting Yourself in the Auto Body and Repair Shop Through Problem-Solving helps students identify attitudes that help or hinder safety and health on and off the job. Using scenarios, students find solutions to real life situations in which an auto body and repair worker suspects exposure to a breathing hazard.

Health Messages

There are five basic health messages provided to students throughout the sessions. They are:

- All occupational lung diseases are preventable
- There are things you can do to prevent occupational lung disease
- There are steps you can take to work safely with chemicals and other toxic substances
- There are things that an employer is legally required to do to keep the workplace safe and healthy
- Solutions to problems concerning breathing hazards in the workplace can be found

A complete list of the health messages for each session can be found in the Appendix to the Teacher's Guide.

Development of the Future Workers' Education Project

The Future Workers' Education Project has been developed by the American Lung Association. A technical advisory group consisting of physicians and research scientists specializing in occupational health, experts in vocational and secondary education, and social scientists contributed to its development.

The program was tested in six vocational schools located in cities across the United States with the help of local American Lung Associations in these areas. It is now available to all vocational schools, technical schools and comprehensive high schools across the United States by way of local American Lung Associations nationwide.

The Future Workers' Education Project Package Contains:

- **A Teacher's Guide** which describes the project, explains how to use the lesson plans, and how to make the project a continuing part of a teacher's yearly curriculum.
- **A Teaching Curriculum** containing questions to generate discussion, health messages (content) and detailed instructions on how to carry out each session.
- **Transparencies** that summarize key points of information during an activity. They are keyed to instructions in the curriculum that tell you how and when to display them.
- **Handouts** that reinforce, in greater detail, the key health messages for each session. They are also take-home references that students should keep in a notebook.
- **Worksheets** that help students identify key information necessary to protect themselves against lung hazards in the auto body and repair shop.
- **A Glossary** of technical words and their meaning.
- **A Teacher's Resource Packet** on occupational lung disease.

II. How to use the curriculum

The Future Workers' Education Project curriculum is designed to help you lead discussions and activities on occupational lung health and safety in the auto body and repair shop. A highly interactive approach has been chosen in order to keep students actively involved in the learning process.

Format

The Future Workers' Education Project curriculum has been designed to make each session as easy as possible to carry out. Each of the four sessions follows a similar format. Let's take SESSION I as an example.

1. Objectives

This section lists the instructional objectives for each session. Each objective specifies measurable cognitive, affective or psychomotor skills that the student will be able to perform by the end of the session. Objectives that challenge students' higher order thinking skills are noted. All objectives are written in behavioral terms and follows Bloom's Taxonomy of Mastery Learning.

2. Activities

This section lists the instructional activities that will take place in class to meet the instructional objectives. You may find that some activities may not fulfill all of the competency-based teaching objectives for health and safety in your class. Choose the activities that best enhance your own curriculum.

3. Materials Needed

This section lists all materials needed to teach the session. Materials common to all sessions are worksheets, and handouts. Additional materials or supplies vary by session and may include transparencies, video tapes, VCRs, pencils, paper, straws, and models of healthy and diseased lungs.

4. Estimated Time

You may find that there isn't enough time to carry out all activities thoroughly in one class period. A session may be taught in its entirety or broken into two or more parts.

5. Instructions

This session contains instructions to teachers on how to carry out the activities in the session. It suggests how to arrange the shop area for an inspection, how to conduct a debate or a brainstorming session. It instructs the teacher when and how to use demonstration models, transparencies, worksheets and handouts. It also provides open-ended questions to generate discussion. These questions are designed to stimulate students, not teachers, to provide the informational portion of the session.

6. Health Messages

This is the informational portion of the lesson. Health messages are simply presented using as little technical language as possible to make key points. More detailed information on the substance of the lesson is provided to students at the end of a session in the form of handouts and worksheets.

7. Materials/Notes

This marginal column lists the items needed to teach the activity as they are used. It also provides a place to write your own notes to personalize the lesson.

Eight (8) Point Summary of How to Use the Future Workers' Education Project Curriculum

1. Assemble all materials, i.e. transparencies, worksheets, and handouts needed for the session. Try to store them in one place.

2. Arrange the room as needed to carry out the session. Place all materials in an easy to reach location.

3. Describe the topic and activities for the session found in the Activities section.

4. Use questions to generate discussion, and to elicit the informational content of the session.

5. Write key information on chalkboard.

6. Provide information to students that you could not elicit using questions.

7. Summarize key points to remember in an activity using the chalkboard, transparency or handout as instructed.

8. Summarize the session and provide students with a preview of the following session.

III. How to prepare to teach this program

1. INCREASE YOUR UNDERSTANDING OF OCCUPATIONAL LUNG DISEASE. To do this, we have provided you with your own resource packet on occupational lung disease. This folder contains detailed information on ten areas of information about lung disease. These areas are similar to those presented in the curriculum to students; however, the language and style of presentation has been adapted for teachers. In addition to these materials, you may wish to speak with the person responsible for occupational health at your local American Lung Association to discuss any questions that you have about occupational lung disease.

2. GET THE MATERIALS YOU WILL NEED. Review page two (2) of each session which contains a list of all materials needed. Store all materials in one place.

3. PRACTICE EACH SESSION. Practice each session before you present it. You may want to get together with another teacher and take turns role playing, or you may simply practice it at home in front of the mirror by yourself. It's better to run through it once with another person, if possible.

Practice one activity at a time.

Write notes to yourself in the margins about how you will change an activity.

4. USE THE INTERACTIVE APPROACH to carry out each activity. If students are actively involved in the session, they will be more likely to remember and use the information they have learned.

- Use open-ended questions, rather than questions that require a yes/no response to encourage student involvement. For example, ask: "What do you think you can do to prevent lung disease?" "What else?" rather than "Do you think that by not smoking you can prevent lung disease?

- Repeat the student's name, and use the student's own words as much as possible when eliciting the informational content of the session. For example, Bob says that the main thing he looks for on a chemical container warning label is "a picture of a skull and crossbones."

- Encourage differences of opinions as well as consensus to help generate discussion. For example, "Ron says that smoking should be allowed in some areas of the shop. Does anyone feel differently?"

- Help students resolve potential dilemmas they will face by encouraging unique solutions by group members. For example, "Sheila says most auto repair shops do not have adequate exhaust systems that remove contaminants at their source. What can a worker do about that? What else? What would you do?"

- Give students lots of positive reinforcement about how well they are learning about occupational lung disease and how to protect themselves. It's important to foster a positive attitude in students about what they can do to try to protect themselves.

- To correct a wrong answer or an idea based upon a myth, ask the question again. If other students repeat the misinformation, use the phrase "researchers in occupational health tell us that . . ." to introduce the correct information. For example, students may express the belief that they are too young to be concerned about an occupational lung disease: "It only happens to older people." Your response to this might be: "Occupational health researchers tell us that exposure to metal fumes can cause workers to develop metal fume fever within a few days."

- Relate your own experiences to students (modeling) to encourage students to do the same.

Future Workers' Education Project Instructional Objectives

SESSION I: CIGARETTE SMOKING IS HAZARDOUS — ESPECIALLY IN THE AUTO BODY AND REPAIR SHOP

Cognitive: Students will be able to:

State at least two ways the lungs protect themselves from dirty air in the auto body and repair shop.

Recognize that exposure to breathing hazards in the auto body and repair shop can cause them to develop lung disease.

List at least two symptoms of lung disease.

List at least two special hazards associated with cigarette smoking in or near the auto body and repair shop.

Identify at least four ways to prevent or reduce the harmful effects of exposure to cigarette smoke in the auto body and repair shop given a hypothetical situation. (Higher Order Thinking Skills)

Affective: Students will be able to:

Describe their feelings when simulating lung damage.

Describe their feelings about the value of a smoking policy at school or in the auto body and repair shop that protects the health of all workers.

Skills: Students will be able to:

Create and/or defend a smoking policy for an auto body and repair shop. (Higher Order Thinking Skills)

SESSION II: HOW TO INSPECT AN AUTO BODY AND REPAIR SHOP FOR BREATHING HAZARDS

Cognitive: Students will be able to:

List at least three ways toxic substances enter the body.

Make the distinction between short-term and long-term health effects caused by exposure to breathing hazards in the auto body and repair shop.

Develop at least three clues that can be used to determine if breathing hazards exist in the auto body and repair shop.

Describe a breathing hazard found in the auto body and repair shop that is both hard to recognize and that can be deadly.

Describe at least five common breathing hazards found in the auto body and repair shop.

Describe at least six ways to reduce the harmful effects of exposure to breathing hazards in the auto body repair shop. (Higher Order Thinking Skills)

Affective: Students will be able to:

Gain confidence in their ability to identify breathing hazards in the auto body and repair shop given the completion of a checklist.

Skills: Students will be able to:

Conduct an inspection of an auto body and repair shop for breathing hazards. (Higher Order Thinking Skills)

SESSION III: PROTECTING YOURSELF IN THE AUTO BODY AND REPAIR SHOP THROUGH TRAINING

Cognitive: Students will be able to:

Explain the OSHA Federal Hazard Communication Standard (HazCom) as the standard which gives workers the right to training and information about breathing hazards in the auto body and repair shop.

Describe at least four types of information that workers are entitled to under the "HazCom" Standard.

Describe three types of safety information to look for on a chemical container warning label.

Explain the Material Safety Data Sheet as a vital source of comprehensive information about breathing hazards in the auto body and repair shop.

Describe the appropriate use of respirators in the auto body and repair shop, and the limitations of respiratory protection.

Affective: Students will be able to:

Describe their feelings about their right to training to protect themselves against breathing hazards in the auto body and repair shop.

Express confidence that they can find out about breathing hazards in the auto body and repair shop by consulting warning labels and Material Safety Data Sheets.

Skills: Students will be able to:

Demonstrate ability to correctly apply the information on a chemical warning label using a breathing hazard commonly found in an auto body and repair shop. (Higher Order Thinking Skills)

Demonstrate ability to correctly apply the information on a Material Safety Data Sheet for a breathing hazard commonly found in an auto body and repair shop. (Higher Order Thinking Skills)

SESSION IV: PROTECTING YOUR HEALTH IN THE AUTO BODY AND REPAIR SHOP THROUGH PROBLEM-SOLVING

Cognitive: Students will be able to:

Identify at least four steps workers can take if exposure to a breathing hazard in the auto body and repair shop is suspected given a hypothetical situation. (Higher Order Thinking Skills)

Identify attitudes that help or hinder health and safety in the auto body and repair shop given a hypothetical situation. (Higher Order Thinking Skills)

Affective: Students will be able to:

Express their feelings regarding the importance of solving health and safety problems in the auto body and repair shop if they suspect exposure to a breathing hazard.

Skills: Students will be able to:

Apply problem-solving skills related to exposure to a breathing hazard in the auto body and repair shop. (Higher Order Thinking Skills)

Future Workers' Education Project Health Messages

SESSION I:

Exposure to breathing hazards in the workplace can cause lung disease.

All occupational lung diseases are preventable.

There are skills you can learn which will help prevent or minimize your exposure to breathing hazards in the workplace.

There are four things that students can do now to prevent lung disease:

1. Stop smoking
2. Avoid secondhand smoke
3. Take precautions to avoid breathing in toxic materials
4. Seek treatment for lung infections

Cigarette smoke contributes to a hazardous work environment. It forces everyone to breathe polluted air, adds to a person's total exposure to chemicals, and increases the risk of accidents, fires, and explosions.

You can protect yourself from the hazards of cigarette smoke at work.

If you're a smoker, you can:

1. Keep tobacco products out of your work area
2. Smoke only in designated areas that are well-ventilated
3. Always wash your hands before smoking and eating because your hands may be contaminated
4. Ask your employer to provide quit smoking programs and incentives to quit

If you're a nonsmoker, you can:

1. Ask your employer to create a smoke-free work area
2. Ask your employer to allow you to work in a smoke-free work area
3. Work with co-workers toward a total ban on smoking at the worksite
4. Contact your local American Lung Association for information on how your company can go smoke free

A well designed worksite smoking policy protects the health of all its workers.

SESSION II

There are many potential breathing hazards in the auto body and repair shop. Some breathing hazards are both difficult to recognize and deadly (for example: asphyxiants).

There are three ways that toxic substances from the auto body and repair shop can enter the body: inhalation; skin absorbtion; and ingestion.

There are clues that can help you recognize breathing hazards in the workplace:

1. Eye, nose and throat irritation
2. Odors
3. Visible dust or fumes
4. Processes that generate exposures, like sanding, grinding, and spraying, or operations using heat
5. Operations using chemicals
6. Poor housekeeping
7. Persistent or recurring symptoms or illnesses, or acute symptoms such as a cough associated with a particular process

Employers can use engineering controls such as substitution, change process, isolation or enclosure, and ventilation to create a safe and healthful workplace.

Workers should participate in decisions to design or change workplace practices because they have the most experience in the actual work and have a personal interest in safety.

There are things you can do to work safely with chemicals in the auto body and repair shop.

1. Keep your work space clean, uncluttered and free of chemicals such as dust build-up, and solvent spills. Make sure all chemicals have readable labels and are stored properly.

2. Do not eat or drink in the work area.

3. Do not smoke in or near the work area.

4. Wash chemicals from your skin before you eat, drink or smoke. Make sure you use soap or waterless hand cleaners and not a solvent. Pay special attention to hands and face. Showering before leaving work may be a necessary precaution.

5. Remove contaminated clothes and change into clean ones before going home. Use laundry services at work if available. Don't bring toxic chemicals home to your family.

6. Use safety equipment to protect you from breathing hazards as indicated on the Material Safety Data Sheet (MSDS).

7. Use chemicals in well ventilated areas.

8. Make sure local exhaust ventilation works and use it.

9. Use an exhaust ventilation system that hooks to a tailpipe and moves air outside of a building when doing automobile tuning and repair.

10. Use a High Efficiency Particulate Air (HEPA) vacuum for cleaning and repairing of asbestos brake linings and clutches.

11. Make sure the solvent cleaning tank is equipped with an exhaust system vented directly to the outside of the building.

12. Make sure you do wet mop clean up rather than dry sweeping. Wet methods can reduce dust levels up to 90%.

13. Wash hands before and after using the restroom. Your hands may be contaminated.

SESSION III

Legally, all workers have the right to a safe and healthful workplace according to the 1970 Occupational Safety and Health Act.

The Federal Hazard Communication Standard ("HazCom"), 1983, gives workers the legal right to training about:

1. The chemical ingredients in each product and not just the trade name
2. Health effects
3. Safe work practices, protective equipment and ventilation required
4. Symptoms of overexposure
5. Emergency procedures and treatment
6. Flammability and chemical reactivity

Your employer must also provide you with:

1. A written copy of the shop's Hazard Communication (HazCom) Program.
2. A complete list of the hazardous substances used in the shop. The employer must compile this list and allow workers to see it.
3. Material Safety Data Sheets for all hazardous substances that you are exposed to at work. The employer must keep these on file and make them available to workers upon request.
4. A copy of your medical records related to your job exposures and health status.
5. All company monitoring data for toxic substances.

Finally you should know that you have the legal right to call OSHA to inspect a workplace without revealing your name.

There are legal exposure limits (Permissible Exposure Limits or P.E.L.'s) that indicate how much of a toxic substance workers can be exposed to averaged over an 8-hour period. A low P.E.L. means a substance is very hazardous.

Information on chemical container warning labels is easy to read and can protect you from exposure to breathing hazards.

The Material Safety Data Sheet (MSDS) provides more detailed information on toxic substances found in the auto body and repair shop.

If your job or task cannot be protected with engineering controls, like local exhaust ventilation, you need to wear a respirator.

Two types of respirators commonly used in the auto body and repair shop are: **air purifying respirators** and **air-supplying respirators.**

Air-purifying respirators only remove certain contaminants from the air. They do not provide air from a clean source outside the shop like air-supply respirators. Air-purifying respirators must not be used in work areas where there is not enough oxygen to support life or where toxic substances are present at high levels.

Air-supplying respirators provide air from a clean source outside the work area. These can be used in areas with low oxygen levels (like confined spaces) and in areas where high levels of toxic chemicals are present.

It is your employer's **legal responsibility** to:

- Select the proper respirator for the job
- Train you in how to properly use each respirator
- See that the respirator fits you properly
- See that the respirator is maintained and that parts are replaced

Respirators should only be used:

1. When engineering controls are not possible
2. When engineering controls are not sufficient to reduce exposure
3. On a temporary basis while a company is waiting to install engineering controls (e.g., local exhaust ventilation, enclosure of a process)
4. During short-term maintenance procedures
5. During emergency procedures

Make sure the respirator you use has been certified by NIOSH (National Institute for Occupational Safety and Health).

SESSION IV

There are steps you can take if you think you're being exposed to a health hazard at work.

1. Find out more information about the hazard:

- Consult the warning label.
- Consult the MSDS.
- If the company takes measurements of chemicals in the air, ask to see copies of the results.
- If still in doubt about a chemical, call the National Institute for Occupational Safety and Health (NIOSH) at 1-800-35-NIOSH. They can also send you information on specific hazards and controls.

2. Find out what's presently being done about the hazard and whether it is appropriate.

- Ask to see the company's HazCom Program.

3. Document any symptoms you are having which may be a result of exposure to the hazard.

- Keep a record of when they occur and if they go away on weekends or vacations.
- Ask co-workers if they are having similar symptoms.
- See a doctor about tests that might be available to determine if overexposure has occurred.

4. Talk to your supervisor and/or other company personnel about the problem.

5. Contact the health and safety representative for your union if you are a member of one.

6. Seek additional outside help.

- You have a right to anonymously request an OSHA inspection of your work area if you suspect you are being exposed to a breathing hazard.
- Call your union representative, if you are a member of one, or your nearest OSHA office to find out the procedure for requesting an inspection.

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Auto Body and Repair Curriculum

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Session I:
Cigarette smoking is hazardous — especially in the auto body and repair shop

Objectives:

Cognitive: Students will be able to:

- State at least two ways the lungs protect themselves from dirty air in the auto body and repair shop.
- Recognize that exposure to breathing hazards in the auto body and repair shop can cause them to develop lung disease.
- List at least two symptoms of lung disease.
- List at least two special hazards associated with cigarette smoking in or near the auto body and repair shop.
- Identify at least four ways to prevent or reduce the harmful effects of exposure to cigarette smoke in the auto body and repair shop given a hypothetical situation. (Higher Order Thinking Skills)

Affective: Students will be able to:

- Describe their feelings when simulating lung damage.
- Describe their feelings about the value of a smoking policy at school or in the auto body and repair shop that protects the health of all workers.

Skills: Students will be able to:

- Create and/or defend a smoking policy for an auto body and repair shop. (Higher Order Thinking Skills)

Activities	Materials Needed	Estimated time
A. Discussion — Basic information about lung disease		5 Minutes
B. Demonstration — How it feels to breathe with damaged lungs	Large drinking straws Model — "Damaged Lungs"	5 Minutes
C. Exercise — Generate a list of problems and solutions related to cigarette smoke at work	Handout No. 1 — "What's Wrong With This Picture?" Chalkboard Handout No. 2a — "Story of Beth" Handout No. 2b — "Story of Ray"	20 Minutes
D. Option 1: Debate — Should smoking be allowed at work?	Chalkboard	15 Minutes
Option 2: Create a smoking policy	Handout No. 3 — "Sample Worksite Smoking Policy" Worksheet No. 1 — Worksite Smoking Policy"	
E. Optional Videotape — Secondhand Smoke		

Note: Since the videotape on second hand smoke adds another 16 minutes to the session, you might want to show it during another class period, rather than extend the class beyond 45 minutes.

TOTAL: 45 MINUTES

Activity A: Discussion

Basic information about lung disease

Instructions	Health Messages	Materials/Notes
1. Introduce the purpose of the Future Workers' Education Project Auto Body and Repair Curriculum.	• Every year thousands of workers in the U.S. develop a lung disease such as bronchitis, asthma, emphysema or cancer because of exposure to breathing hazards on the job. This could happen to us — people who work in an auto body and repair shop. • Substances which are inhaled into the body can also affect other organ systems (such as the heart, liver, kidney, brain, skin and reproductive system). • For the next four sessions we are going to identify the major breathing hazards in our own work environment and figure out ways to prevent or minimize exposure to them.	
2. Compare the care and functioning of a car to the lungs.	• Let's begin by taking a look at how the lungs work and how they protect us from breathing hazards in the auto body and repair shop.	
Ask students: • How much air do you think the lungs process in one day?	• The lungs process approximately 10,000 quarts of air each day.	

Instructions	Health Messages	Materials/Notes
• How much air do you think a car processes under normal driving conditions?	• A car processes almost 18,000 quarts (or 4,500 gallons) of air per minute under normal driving conditions.	
Ask students: • What do the lungs do?	• The lungs supply oxygen needed by the body to survive, and remove carbon dioxide (a waste product) produced by the body's tissues. This exchange of oxygen and removal of carbon dioxide takes place in the air sacs (alveoli) of the lungs.	
Ask students: • How is the carburetor of the car like the lungs?	• The carburetor mixes gas and air to make the engine go. Our lungs provide oxygen which burns the fuel that makes our bodies "go."	
Ask students: • What happens to the carburetor of a car if it gets dirty?	• If dirt gets into the carburetor, there is a buildup of varnish and the engine runs poorly.	
Ask students: • What defense does the carburetor have to keep dirt out?	• The air filter and gas filter keep dirt out of the carburetor.	
Ask students: • What defenses do the lungs have to keep dirt out?	• The lungs have four defenses to keep dirt out. Your nose is the first line of defense. The large hairs and moist mucous membrane of the nose filters out large particles.	
Add information if not mentioned.	• Coughing is another line of defense. When you cough, foreign material is expelled from your airways.	

Instructions	Health Messages	Materials/Notes
	• Tiny hair-like projections (cilia) in your windpipe and bronchial tubes sweep particles and mucus, as if on an escalator, up to the mouth. Mucus traps dirt, chemicals, bacteria and viruses. Once trapped and swept up to the mouth, you either swallow them or spit them out.	
	• Scavenger cells move through the lung tissue and remove particles that get past the nose, throat and upper airways.	
3. Using the Model, ask students to describe the onset of lung disease.		**Model** — "Damaged Lungs" Your Lung Association may be able to provide you with this model, or an illustration depicting damaged lungs.
Ask students: • What happens to the lungs if they get dirty?	• Under normal conditions the lungs' defenses work very well. But, if exposed repeatedly to even small amounts of substances that we find in the shop like exhaust fumes, dusts and cigarette smoke, these defenses become overwhelmed. Your lungs will become damaged. If enough damage occurs, you will develop a lung disease such as chronic bronchitis or emphysema. Some substances can cause lung cancer.	
Ask students: • Who knows what asbestosis is? • Where can asbestos be found in the auto body and repair shop?	• Asbestosis is an occupational lung disease. The lungs become stiff and scarred from breathing in asbestos fibers. Asbestos fibers can be found in clutch linings and in some brake linings of automobiles. Exposure to asbestos also causes cancer.	

Activity B: Demonstration

How it feels to breathe with damaged lungs

1. Pass out straws to students. Ask them to breathe through straws at the same time that they pinch their noses. Ask them to walk around the classroom like this for 60 seconds.

2. Collect straws.

3. Conduct a brief discussion with students on how it feels to breathe with damaged lungs. Convey all health messages.

   Ask students:
   - How did you feel while performing the exercise?
   - What are the symptoms of lung disease?
   - Who do you know that has a lung disease?
   - How did it happen?
   - How does this person function?
   - Do you think lung disease is preventable?
   - Why or why not?

- The effort required to complete a breath is greatly increased for people with lung disease.
- When the breathing capacity is severely restricted, physical activity is limited.
- We will spend a third of our adult lives at work. Working in dirty air increases the chance of damaging our lungs.

- Some symptoms of lung disease are: difficulty breathing, increased mucus production, cough, tightness in the chest, fatigue, and wheezing.
- The symptoms of lung disease may come on so gradually that they are often ignored.
- All work-related lung diseases are preventable.

Large drinking straws (enough for each student in the class)

Teacher's note: Caution any student with a breathing problem not to participate.

Teacher's note: If you have any of the symptoms of lung disease, or a diagnosed lung disease due to an occupational exposure, and you feel comfortable talking about it, share this information with your students.

Instructions

- How can you prevent yourself from developing lung disease?

Health Messages

- There are four ways to prevent lung disease:

  1. Stop smoking. Smoking is the number one preventable cause of lung disease in this country, so it's important to quit if you smoke. This will prevent you from developing lung diseases such as chronic bronchitis, emphysema and lung cancer.

  2. Avoid secondhand smoke. Secondhand smoke has two major components:

     - Mainstream smoke — the smoke inhaled and exhaled by a smoker.

     - Sidestream smoke — the smoke that goes into the air from the burning tobacco. Sidestream smoke has higher concentrations of some harmful compounds than the mainstream smoke exhaled by the smoker.

  3. Take safety precautions to avoid breathing toxic chemicals and other hazardous materials.

  4. Seek treatment for lung infections and any symptoms of lung disease such as chronic cough, wheezing, or shortness of breath.

Materials/Notes

Activity C: Exercise

Generate a list of problems and solutions related to cigarette smoke at work

1. Give students Handout No. 1 depicting special hazards of cigarette smoke at work. Have students circle all the dangers found in the picture.

   Ask students:
   - What are the special dangers of cigarette smoke to auto body and repair workers?

Write special dangers on chalkboard.

Elicit students' responses. Add responses not mentioned.

- **Adds to Your Total Exposure to Chemicals** — If you smoke in the auto body and repair shop, you'll be putting your entire respiratory system at unusually high risk for developing lung disease. There are over 4,000 chemicals in cigarette smoke. If you smoke, you expose yourself to these chemicals, in addition to the toxic substances in the auto body and repair shop such as solvents, welding fumes, dusts, epoxy and fiberglass resins, primer, topcoat and lacquer mists. This added exposure increases your likelihood of developing a lung disease such as chronic bronchitis, emphysema, or lung cancer.

Handout No. 1 — "What's Wrong With This Picture?"

Chalkboard

Instructions	Health Messages	Materials/Notes
Write synergistic on chalkboard and provide students with definition.	• **Synergistic Effects** — Smoking can do more than just add to the harmful effects of other chemicals. It can multiply them. This situation is known as a synergistic effect. Example: asbestos in brake and clutch linings. If you smoke and do not work with asbestos your chances of developing lung cancer are over 10 times higher than people who don't smoke and don't work with asbestos. If you smoke and also work with asbestos your chances of developing lung cancer jump to over 50 times the general nonsmoking population. And, people who smoke more than a pack a day and work with asbestos have almost 90 times the chance of dying of lung cancer as compared with workers who neither smoke nor work with asbestos!	Chalkboard
	• **Contamination** — If you carry cigarettes to your work area, they can be contaminated with chemicals that are present in the workplace. Then, even if you leave the work area to smoke, these chemicals can be inhaled, swallowed (ingested) or absorbed through the skin. Examples: solvents and degreasers.	
	• **Accidents** — Smokers have twice the on-the-job accident rate of nonsmokers. Suggested reasons are: • loss of attention due to pre-occupation with hands, eye irritation, coughing.	

Instructions

2. Distribute Handouts No. 2a and No. 2b. Using the stories, have students develop a list of steps they can take to protect them selves if smoking is allowed at work.
3. Divide students into groups. Have groups brainstorm and list solutions to each worker's problem. Ask a member from each group to present their solutions.
4. Reassemble students and ask each group's recorder to read solutions. Write solutions on the chalkboard.
5. Give students lots of positive reinforcement for their unique solutions. Add all solutions under health messages that students did not mention.

Health Messages

  - decreased alertness and speed of reflexes because of elevated levels of carbon monoxide (a by-product of smoking) in body.
  - cigarettes may cause fire and explosions where flammable and explosive chemicals are stored or used.

- **Secondhand Smoke** — Is a cause of disease, including lung cancer in health nonsmokers!
  - If smoking is allowed where you work, you can take the following actions to protect yourself:

  If you're a nonsmoker:

  - Work with fellow workers towards a complete ban on smoking from the worksite.
  - Ask your employer to allow you to work in a smoke-free area.

  If you are a smoker:

  - Do not carry or store tobacco products in a work area where chemical exposures occur. Leave them behind!

Materials/Notes

Handout No. 2a — "Story of Beth"

Handout No. 2b — "Story of Ray"

- Smoke only in designated areas that are well-ventilated. These areas should be located away from work processes and from nonsmokers.
- Always wash your hands before smoking and eating. They may be contaminated.
- Ask your employer to provide workers with stop smoking programs and incentives not to smoke.
- Contact your Lung Association for information on how to quit.

Activity D: Option 1: Debate

Should smoking be allowed at work?

1. Divide students into two groups: those favoring a total ban on smoking at work and those against it.

   Alternative: use the school's smoking policy as the topic of the debate.

2. Give students 5 minutes to come up with as many arguments as they can for or against their positions.

- Due to state and local laws, many companies have established smoking policies for the workplace.
- Policies about smoking and the workplace should include: restrictions on when and where workers can smoke or a complete ban on smoking; enforcement measures; and incentives to help workers who want to quit.

Instructions	Health Messages	Materials/Notes
3. Conduct debate. Ask students to state and explain their positions. 4. Convey all health messages.	• The ideal smoking policy strictly prohibits smoking within all areas of company owned or leased buildings. • It is important for the worksite smoking policy to protect the health of all workers in an auto body and repair shop. • On your present/next job, or when you apply for your first job, check out the company's smoking policy and ask yourself whether it's adequate.	

Activity D: Option 2:

Create a smoking policy

Instructions	Health Messages	Materials/Notes
1. Give each student a copy of the sample worksite smoking policy. 2. Analyze the components of the smoking policy. Ask students: • What are the components or elements of a good worksite smoking policy? What areas should be covered?	• Many companies have created worksite smoking policies in response to well documented information on the harmful effects of smoking. • Workers often initiate such policies. • A smoking policy should contain the following elements: • purpose of policy	Handout No. 3 — "Sample Worksite Smoking Policy"

Instructions

3. Divide students into groups and give each group Worksheet No. 1.

4. Instruct students to take 5 minutes to design a smoking policy for an auto body and repair shop. As an alternative, assign students to different industries.

5. Ask one member of each group to record its policy on the form.

6. At the end of the work period ask each group to describe its policy. Point out differences and similarities in each.

7. Convey all health messages.

Health Messages

- areas in which smoking will be permitted

- areas in which smoking will not be permitted

- enforcement of policy

- available help for smokers who want to quit

Materials/Notes

Worksheet No. 1 — "Worksite Smoking Policy"

Optional Activity E:

Videotape — "Secondhand Smoke"

VCR, Monitor

Session II:
How to inspect an auto body and repair shop for breathing hazards

Objectives:

Cognitive: Students will be able to:

- List at least three ways toxic substances enter the body.
- Make the distinction between short-term and long-term health effects caused by exposure to breathing hazards in the auto body and repair shop.
- Develop at least three clues that can be used to determine if breathing hazards exist in the auto body and repair shop.
- Describe a breathing hazard found in the auto body and repair shop that is both hard to recognize and can be deadly.
- Describe at least five common breathing hazards found in the auto body and repair shop.
- Describe at least six ways to reduce the harmful effects of exposure to breathing hazards in the auto body and repair shop. (Higher Order Thinking Skills)

Affective: Students will be able to:

- Gain confidence in their ability to identify breathing hazards in the auto body and repair shop given the completion of a checklist.

Skills: Students will be able to:

- Conduct an inspection of an auto body and repair shop for breathing hazards. (Higher Order Thinking Skills)

Activities	**Materials Needed**	**Estimated time**
A. Discussion — How toxic substances enter the body	Chalkboard	5 Minutes
B. Exercise — Generate a list of clues for recognizing breathing hazards in the auto body and repair shop	Chalkboard	10 Minutes
C. Discussion — Six controls to reduce exposure to breathing hazards in the auto body and repair shop	Chalkboard	5 Minutes
D. Exercise — Inspect an auto body and repair shop for breathing hazards	Worksheet No. 2a — "Find the Breathing Hazards in the Auto Body Shop" Worksheet No. 2b — "Find the Breathing Hazards in the Auto Repair Shop" Handout No. 4 — "The Major Breathing Hazards in the Auto Body and Repair Shop"	15 Minutes
E. Exercise — Generate a checklist for health and safety in the auto body and repair shop	Handout No. 5 — "Checklist for Health and Safety in the Auto Body and Repair Shop"	10 Minutes

Note: This session can be carried out in the shop or in the classroom using worksheets 2a and 2b. If carried out in the classroom, use Handout No. 4 as indicated. The session has also been developed so that you can carry out separate inspections on different days (e.g., auto body on day 1 and auto repair on day 2, depending on the amount of time and detail you wish to spend on the inspection process).

TOTAL: 45 MINUTES

Activity A: Discussion

How toxic substances enter the body

1. Have students identify three ways toxic substances enter the body.

Ask students:

- How do toxic substances enter the body? How else?

Elicit students' responses. Add responses not mentioned. Write responses on chalkboard.

- There are three ways that toxic substances can enter the body and cause harm: inhalation, skin absorption, and ingestion.

1. **Inhalation** — Breathing in toxic contaminants is the most common way for them to enter the body. Once inhaled, they may damage lung tissue or enter the blood stream, and be carried to other organs in the body.

2. **Skin Absorption** — Toxic substances can also pass through the skin and into your body. Solvents can pass through openings for hair follicles. They can remove fats and oils needed to protect the skin. Absorption occurs even more quickly if the skin is cut or damaged. Other chemicals pass right through the skin if they come in contact with it. Corrosives, like battery acid, damage the skin immediately on contact.

   Workers should be particularly careful while using high-pressure grease and paint guns. Numerous injuries have occurred as chemicals were injected into the hand or forearm due to excessive gun pressure.

Chalkboard

Teacher's Note: When discussing inhalation of toxic contaminants, it's also important to note that some gases released from industrial processes can displace the oxygen in the air and cause a person to become unconscious and/or suffocate. For example, welding in a confined space may release acetylene. Exhaust fumes release carbon monoxide. These gases are known as asphyxiants.

Instructions

2. Have students define two types of health effects that can result from exposure to toxic substances.

Ask students:

- What type of health damage might occur from exposure to toxic substances?

Elicit students' responses. Add responses not mentioned. Write responses on chalkboard.

Health Messages

3. **Ingestion** — If you eat, drink or smoke in your work area, you may unknowingly ingest chemicals which can pass through your intestinal tract into your blood.

- There are two basic types of health effects that can result from exposure to toxic substances: short-term (acute) effects and long-term (chronic) effects.

  1. **A short-term (acute) effect** is one that can be experienced immediately or soon after exposure to a chemical. The effect may be minor or severe. Acute effects may include eye, nose or throat irritation, headache, dizziness, nausea, poor coordination and difficulty breathing. Acute effects can be serious and even deadly. Dramatic examples include severe eye or skin burns, loss of consciousness or cessation of breathing.

  2. **A long-term (chronic) effect** is usually one caused by exposure to low levels of a chemical or substance over a long period of time. In some instances, however, chronic effects can result from short-term exposure. Chronic effects are usually permanent. Some examples include: lung disease (emphysema, asbestosis), cancer, damage to the reproductive system (sterility) and genetic damage (damage to your offspring).

Materials/Notes

Chalkboard

Activity B: Exercise

Generate a list of clues for recognizing breathing hazards in the auto body and repair shop

1. Prepare students mentally for the inspection (Activity D) by helping them generate a list of clues to recognize breathing hazards in the auto body and repair shop.

   Ask students:
   - What clues can tell you that you are working in dirty air?

   For each ask:
   - Can you give me an example of this clue from the auto body and repair shop?

- There are clues you can use to recognize breathing hazards in the auto body and repair shop:

1. **Eye, Nose, Throat Irritation** — Be aware of eye, nose or throat irritations as you enter a work area. This is a sign that irritating chemicals may be present in the air.

2. **Odors** — A strong odor may be harmless or it may signal the presence of toxic substances. But don't think all is well if you don't smell anything. Some substances, like carbon monoxide gas have no odor even at levels high enough to kill. Also, many vapors, when continuously inhaled, weaken and temporarily deaden a person's sense of smell, making the use of odor as a warning signal ineffective.

3. **Visible Dust or Fumes** — If you see dust on surfaces or being released from operations, it usually means the local ventilation is not functioning properly in your work area or that one is needed. In this situation you can inhale large amounts of harmful substances without respiratory protection.

4. **Processes** — Grinding, sanding, spraying and operations using heat are potential sources of exposure to breathing hazards.

5. **Operations Using Chemicals** — Notice how people are working with them, check labels, and Material Safety Data Sheets to compare warnings with actual operations.

6. **Poor Housekeeping** — Oily rags, open paint and solvent containers, or chemical spills which are left unattended are clues that exposure is occurring. Chemicals are vaporizing into the air and workers are breathing them.

7. **Persistent (Recurring) Symptom(s) or Illness(es)** — A persistent cough, shortness of breath or illness among workers may indicate a job-related health problem. If you notice a number of people in a work area frequently having the same symptoms or illnesses, suspect that they may be work-related.

Activity C: Discussion

Six controls to reduce exposure to breathing hazards in the auto body and repair shop

1. Have students describe controls to look for in the auto body and repair shop that can protect workers against exposure to breathing hazards.

2. During the discussion emphasize to students that substitution of less toxic substances is the best way to control worker exposure, followed by the use of controls such as enclosure and ventilation. Personal protective equipment should be used only as a last resort.

Ask students:
- What are some methods used to control or defend against airborne hazards in industry?

Elicit responses. Add information not mentioned.

Write the six methods on the chalkboard.

- There are six basic methods of controlling or defending against airborne hazards such as dust, fumes, vapors or mists.

  1. **Substitution:** When considering materials, less toxic substances can be substituted for more toxic ones. For example: toluene can be substituted for benzene as a solvent, zinc or barium can be used instead of lead in paint; steel shot can be used instead of sand for blasting. Or even better, a detergent and water solution can be used in place of organic solvents.

Chalkboard

2. **Change process** — An entire process can be changed to protect workers against airborne contaminants. For example, brush painting or dipping can replace spray painting, metals can be joined by crimping instead of welding or soldering; temperature, speed, or pressure of a process may be changed; vats may be filled continuously or mechanically rather than manually or in batches.

3. **Isolation or enclosure** — Processes that produce health and safety hazards can be isolated in one part of the plant and provided with special protective features. For example, booths, or operating machines with remote controls, can be used to protect workers against radiation hazards.

4. **Ventilation** — There are two basic types of ventilation systems:

   1. general or dilution ventilation and;
   2. local or exhaust ventilation.

   — General ventilation adds fresh air to a room to keep contaminants below a certain level. A general system is usually not very effective in controlling toxic hazards. It does not remove the contaminant from the air — it only dilutes concentrations.

Instructions	Health Messages	Materials/Notes
	— A local exhaust system removes contaminants at their source, and is a more effective method of controlling hazards. • These first four controls are known as engineering controls. 5. **Personal Protective Equipment** — If your job or task cannot be protected with engineering controls, personal protective equipment must be provided to protect you from exposure. Examples are ear plugs, safety glasses and respirators. 6. **Good Housekeeping** — Keeping your workplace clean.	

Activity D: Exercise

Inspect an auto body and repair shop for breathing hazards

1. Divide students into two groups.	• There are many procedures and materials in the auto body and repair shop that expose us to breathing hazards.	Worksheet No. 2a — "Find the Breathing Hazards in the Auto Body Shop"
2. Give Group 1 Worksheet No. 2a and give Group 2 Worksheet No. 2b.	• It's important that you know how to identify breathing hazards in order to determine if you and your employer are taking adequate measures to protect you from over-exposure.	Worksheet No. 2b — "Find the Breathing Hazards in the Auto Repair Shop"

Instructions	Health Messages	Materials/Notes
3. Explain that the forms will be used to conduct an inspection of the work area for breathing hazards.	**• Let's use the worksheets to conduct an inspection of our work area.**	
4. Instruct students to inspect their assigned areas. Have students name and record as many hazards, clues, and methods of protection associated with each process listed on the worksheets as they can.		
5. Reassemble students.		
6. Begin with the auto body operations. Elicit from students all breathing hazards, clues and methods of protection they identified. Provide information not mentioned using Handout No. 4 (this will be distributed to students at the end of the activity).	• Provide all health information found on Handout No. 4 — "The Major Breathing Hazards in the Auto Body and Repair Shop"	
Ask students: • What breathing hazards did you find in the auto body shop? For each ask: • What clues did you use to find it? • With what process(es) is it associated? • How might this substance enter the body? • How else? • What measures can employers take to prevent or minimize exposure to this hazard? • What measures can workers take to prevent or minimize exposure to this hazard?	• Emphasize to students that protection against exposure to breathing hazards should always begin with: 1. Substitution of less hazardous materials. 2. Engineering controls. 3. Personal protective equipment should only be used as a last resort (i.e., when substitution and/or engineering controls are not possible, or are insufficient to control exposure to the hazard).	Chalkboard

Instructions	Health Messages	Materials/Notes
7. Conduct a discussion of breathing hazards for auto repair operations. Use questions to generate discussion found above.		
8. Give students Handout No. 4 as a resource.		Handout No. 4 — "The Major Breathing Hazards in the Auto Body and Repair Shop" Teacher's Note: The student version of Handout No. 4 focuses only on the processes, breathing hazards and health effects. Your version contains greater detail and can serve as a resource for you.

Activity E: Exercise

Generate a checklist for health and safety in the auto body and repair shop

1. Have students develop a mental checklist for health and safety in the auto body and repair shop. Use the following hypothetical situation: You are about to graduate. You are going on your first job interview with A.J. Auto Body and Repair Shop and the supervisor gives you a tour of the shop. What questions about health and safety can you ask yourself as you tour the shop? Elicit students' responses. Write responses on chalkboard. Add responses not mentioned. 74	Checklist for Health and Safety in the Auto Body and Repair Shop IS THE WORK AREA CLEAN? • no spills, oily rags • chemicals are labeled and stored properly DO WORKERS EAT OR DRINK IN THE WORK AREA? IS SMOKING ALLOWED ON THE PREMISES?	Chalkboard 75

Instructions

Health Messages

Materials/Notes

ARE LOCAL EXHAUST VENTILATION SYSTEMS WITH HOODS AVAILABLE AND IN USE?

- adequate — one in each major work area
- working properly — move air away from body, not toward it
- exhaust pipe hooks to exhaust system that moves air outside of building

IS THE SOLVENT CLEANING TANK EQUIPPED WITH AN EXHAUST SYSTEM VENTED DIRECTLY TO THE OUTSIDE OF THE BUILDING?

IS THERE A SPECIALLY DESIGNED BOOTH AVAILABLE FOR SPRAY PAINTING?

IS A HIGH EFFICIENCY PARTICULATE AIR (HEPA) VACUUM USED FOR CLEANING AND REPAIR OF ASBESTOS BRAKE LINING AND CLUTCHES?

- asbestos dust is removed in sealed containers or bags
- labelled and disposed of at an approved hazardous waste dump

DO WORKERS USE COMPRESSED AIR TO CLEAN ASBESTOS BRAKE OR CLUTCH LININGS (WRONG WAY)?

Instructions	Health Messages	Materials/Notes
	DO WORKERS DO WET MOP CLEAN UP (RIGHT WAY)? RATHER THAN DRY SWEEPING (WRONG WAY)? DO WORKERS WASH THEIR HANDS BEFORE EATING, DRINKING OR SMOKING WITH SOAP AND WATER OR WATERLESS HAND CLEANERS (RIGHT WAY)? DO WORKERS WASH THEIR HANDS WITH SOLVENTS (WRONG WAY)? IS OTHER PROTECTIVE EQUIPMENT AVAILABLE AND IN USE? • a NIOSH-approved respirator for each chemical or job that requires respirator use • gloves • goggles • head protection • aprons • other? describe: ____________________ ____________________	
2. Summarize the session.	• We've just inspected the auto body and repair shop for breathing hazards. When you go on your next interview you can use the checklist that we developed to help you decide if you want to take the job should it be offered to you. • Remember we spend a third of our lives at work. Working in dirty air leads to lung disease.	

Instructions	Health Messages	Materials/Notes
	• You have a choice about the type of environment in which you wish to work. • Choose the work environment that is least likely to lead to lung disease. • The same chemicals that you will be exposed to at work are also in your homes, and can affect you as you are working on your car. • Protect yourself against breathing hazards at nome, too.	
3. Give students Handout No. 5. Explain to them that all information covered in this activity is contained in this handout.		Handout No. 5 — "Checklist for Health and Safety in the Auto Body and Repair Shop"

Session III:
Protecting yourself in the auto body and repair shop through training

Objectives:

Cognitive: Students will be able to:

- Explain the OSHA Federal Hazard Communication Standard (HazCom) as the standard which gives workers the right to training and information about breathing hazards in the auto body and repair shop.
- Describe at least four types of training that workers are entitled to under the HazCom Standard.
- Describe three types of safety information to look for on a chemical container warning label.
- Explain the Material Safety Data Sheet as a vital source of comprehensive information about breathing hazards in the auto body and repair shop.
- Describe the appropriate use of respirators in the auto body and repair shop, and the limitations of respiratory protection.

Affective: Students will be able to:

- Describe their feelings about their right to training to protect themselves against breathing hazards in the auto body and repair shop.
- Express confidence that they can find out about breathing hazards in the auto body and repair shop by consulting warning labels and Material Safety Data Sheets.

Skills: Students will be able to:

- Demonstrate ability to correctly apply the information on a chemical warning label using a breathing hazard commonly found in an auto body and repair shop. (Higher Order Thinking Skills)
- Demonstrate ability to correctly apply the information on a Material Safety Data Sheet for a breathing hazard commonly found in an auto body and repair shop. (Higher Order Thinking Skills)

Activities	Materials Needed	Estimated time
A. Discussion or mini-lecture — The Federal Hazard Communication Standard and your right to training and information about hazards in the auto body and repair shop	Transparency No. 1 — "Federal Hazard Communication Standard (HazCom)" Transparency No. 2 — "Additional Worker Rights"	10 Minutes
B. Training — How to read a chemical container warning label	Handout No. 6 — "What to Look for in a Warning Label" Worksheet No. 3 — "Chemical Warning Label"	10 Minutes
C. Training — How to read a Material Safety Data Sheet	Handout No. 7 — "How to Read a Material Safety Data Sheet" Handout No. 8 — "Sample Material Data Safety Sheet" Worksheet No. 4 — "Material Safety Data Sheet"	10 Minutes
D. Discussion — Basic information about respirators	Handout No. 9 — "Six Facts You Must Know About Respirators"	10 Minutes
		TOTAL: 40 MINUTES

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Activity A: Discussion

The Federal Hazard Communication Standard and your right to training and information about hazards in the auto body and repair shop

- Conduct a discussion on workers' rights to a safe and healthful workplace.

Ask students:
- Who can tell me what OSHA stands for?

Ask students:
- What does OSHA do?

Elicit students' responses. Add responses not mentioned.

- It's important for you to remember that you have a legal right to a safe and healthful workplace! This right is guaranteed by the OSHAct of 1970.
- OSHA stands for the Occupational Safety and Health Administration.
- This organization sets the federal standards for a safe and healthful workplace and inspects workplaces for violations of the law.
- OSHA also sets specific exposure limits for many fumes, gases and chemicals we may breathe in an auto body and repair shop over an eight-hour period of time. These are called permissible exposure limits, or PEL's.

Instructions	Health Messages	Materials/Notes
	• Many scientists agree that there is no safe limit of exposure to cancer-causing substances found in the auto body and repair shop (asbestos, for example). For cancer-causing substances, the PEL can be as low as 1 and under. In general, exposures should be carefully controlled and kept to an absolute minimum. Wherever possible, these substances should be completely eliminated from the workplace and less harmful ones substituted.	
2. Display Transparency No. 1 Ask students: • What else has OSHA done to help foster a safe and healthful work environment? Elicit students' responses.	• OSHA passed a very important regulation called the Federal Hazard Communication Standard (often called HazCom). This gives workers the right to know about all chemicals they work with on the job. This is often called Hazard Communication (HazCom) Training. Specifically, before you use a hazardous chemical your employer must train you about: 1. The chemical ingredients in each product and not just the trade name. 2. Health effects. 3. Safe work practices, protective equipment and ventilation required. 4. Symptoms of overexposure. 5. Emergency procedures and treatment. 6. Flammability and chemical reactivity information.	Transparency No. 1 — "Federal Hazard Communication Standard (HazCom)"

Instructions	Health Messages	Materials/Notes
3. Display Transparency No. 2	• Your employer must also provide you with: 1. A written copy of the shop's Hazard Communication (HazCom) Program. 2. A complete list of the hazardous substances used in the shop. The employer must compile this list and allow workers to see it. 3. Material Safety Data Sheets for all hazardous substances that you are exposed to at work. The employer must keep them on file and make them available to workers upon request. 4. A copy of your medical records. 5. All company monitoring data for toxic substances. • Finally, you should know that you have the legal right to call OSHA to inspect a workplace without revealing your name.	Transparency No. 2 — "Additional Worker Rights"

Activity B: Training

How to read a chemical container warning label

1. Give students Handout No. 6. Have them identify the type of information found on a chemical warning label.

Ask students:

- What kind of information can you find on a warning label?

Elicit students' responses.

- Labels are an important part of your employer's Hazard Communication Program. Together with the Material Safety Data Sheets (MSDS's) chemical labels provide you with the information you need to know to work safely with chemicals.
- When you look at a warning label, look for the following information:

1. Name of hazard (not the trade name, but the chemical name[s]).
2. Severity of hazard.
   - A picture of a skull and crossbones means that a chemical is highly toxic. It is always used with one of these signal words: Caution (least severe), Warning (very severe) or Danger (most severe).
3. Physical hazards.
   - Be alert to key words like Flammable and Combustible. This means the chemical easily ignites or catches on fire.

Handout No. 6 — "What to Look for on a Warning Label"

Instructions

2. Refer again to Handout No. 6.

   Ask students:
   - How serious a hazard is ________?
   - What are the health hazards associated with ________?
   - What information on the label tells you how to use ________ safely?
   - What are the first aid instructions for ________?

Health Messages

- Also be alert to the word Corrosive. A corrosive is a substance that dissolves metals or other materials. It damages skin and other human tissues upon contact. Examples of corrosive chemicals are rust removers and battery acids.

4. Health hazards (e.g. lung irritant, skin irritant).

5. Recommendations for how to safely use the chemical.

6. First aid instruction, should an overexposure occur.

7. Type of protective equipment needed.

8. Type of extinguisher to use for fire fighting.

9. Cleaning up spills properly.

10. Correct disposal procedures.

Materials/Notes

Instructions

- What type of protective equipment is required when using ________?
- What information is not provided on this chemical warning label?

3. Have students draw a line to connect the type of information to look for on a warning label to the type of information available for ________.

4. Collect the handouts, review for accuracy, and return to students to keep as a reference.

5. Alternative: Give each student Worksheet No. 3, divide students into groups, and assign each group a common chemical found in the shop. Have students fill out worksheet.

   Reassemble students and discuss the warning label of each chemical.

Ask students:
- Where might you go for more information on this chemical?

Health Messages

- A complete list of health effects, exposure limits, the type of extinguisher to use for fire fighting, how to clean up spills properly and correct disposal procedures are five types of information that may not be found on a chemical warning label.

- If you have any questions about the substances after you read the label, look at its MSDS.

Materials/Notes

Worksheet No. 3 —
"Chemical Warning Label"

Activity C: Training

How to read a Material Safety Data Sheet

1. Give students Handout No. 7 and help them identify the types of information the MSDS provides workers.

Ask students:

- What information can you find on a Material Safety Data Sheet?

Elicit students' responses.

- Manufacturers of hazardous products are required to provide health and safety information about them. This information is provided in the form of a Material Safety Data Sheet (MSDS).
- The MSDS is an important part of your employer's Hazard Communication Program, and your employer must have one for every hazardous chemical in your workplace.
- Each MSDS contains nine categories of information about a chemical, but format varies from manufacturer to manufacturer.
- When reading an MSDS you can find the following information:

SECTION I — Name of chemical, who makes it, their address and emergency phone number, date produced.

SECTION II — Hazardous ingredients, worker exposure limits (such as PEL).

SECTION III — Physical and chemical characteristics (such as boiling point, appearance and odor under normal conditions).

Handout No. 7 — "How to Read a Material Safety Data Sheet"

Teacher's Note: The MSDS provides vital information about chemicals you use on the job. However, sometimes information is incomplete, particularly in the area of long-term effects. As a result, other references may have to be consulted.

Teacher's Note: ALA Factsheet "How to Read a Material Safety Data Sheet" is provided to you in your resource packet.

Instructions	Health Messages	Materials/Notes
	SECTION IV — Fire and explosion hazard data (e.g., flash point of a chemical). SECTION V — Health hazards (absorption of chemicals into the body, long and short-term health effects). SECTION VI — Reactivity data (conditions that cause the chemical to react dangerously). SECTION VII — Proper clean up of spills. SECTION VIII - Protective measures (substitution, engineering controls such as ventilation requirements, protective equipment and clothing, hygiene practices). SECTION IX - Storage and safe handling procedures.	
2. Give each student Handout No. 8, the sample MSDS.		Handout No. 8 — "Sample Material Safety Data Sheet"
3. Give each student Worksheet No. 4 and ask them to answer the questions using the sample MSDS.	• Compared to the warning label, the MSDS is a more detailed source of vital information about the chemicals you'll be exposed to in an auto body and repair shop.	Worksheet No. 4 — "Material Safety Data Sheet"
4. Give students 15 minutes to complete Worksheets.		
5. Review each section of the MSDS with the class.	• Make sure you read the MSDS on all of the chemicals you'll be handling before you start the job. That way you'll be prepared to work safely.	
6. Convey all health messages.		

Activity D: Discussion

Basic information about respirators

1. Discuss two types of respiratory protection used in auto body and repair shops.

Ask students:
- When should you use a respirator?

Elicit students' responses.

Ask students:
- What are the names of two types of respirators used in the auto body and repair shop?

Elicit students' responses.

- If your job or task cannot be protected with engineering controls, like local exhaust ventilation, you need to wear a respirator.
- There are two general types of respirators: 1. air-purifying respirators, and 2. air-supplying respirators.
  - Air-purifying respirators. They include standard air purifying respirators and powered air-purifying respirators (PAPR). They remove contaminants from the air through a filter mechanism. They must not be used in work areas where there is not enough oxygen to support life or where toxic substances are present at high levels.
  - Air-supplying respirators. They provide air from a clean source outside the work area. These can be used in areas with low oxygen levels (like confined spaces) and in areas where high levels of toxic chemicals are present.

Instructions	Health Messages	Materials/Notes
Ask students: • What legal responsibilities does your employer have with respect to respirators on the job? Elicit students' responses. Add responses not mentioned.	• It is your employer's legal responsibility to: • select the proper respirator for the job. • train you in how to properly use each respirator. • see that the respirator fits you properly. • see that the respirator is maintained and that parts are replaced when necessary.	
Ask students: • Why is choosing the right respirator important?	• If the wrong respirator and/or filter is chosen, you will not receive adequate protection against breathing hazards. For example, a dust respirator designed only to prevent inhalation of dusts will do nothing to protect you from breathing in solvent vapors.	
Ask students: • Why is the fit of the respirator important?	• If your respirator does not fit your face properly, leaking will occur and you will not be adequately protected. Respirators that leak should not be used.	
Ask students: • What should you do if your respirator leaks or is uncomfortable?	• Always report problems regarding fit, comfort or condition of your respirator to your employer.	
Ask students: • What happens to a respirator if it is poorly maintained?	• Respirators greatly lose efficiency when filters or cartridges are not changed as often as required.	
Ask students: • What are some of the limitations associated with respirator use? What else? Add responses not mentioned.	• Respirators: 1. Can be uncomfortable to wear.	

Ask students:

- What are the most important things to remember about the use of respirators?

Elicit students' responses.

2. Can be hard to fit if a person has a small face, beard or glasses. Women can be hard to fit because they may have smaller frames.

3. May not be appropriate for people with lung or heart disease because breathing is more difficult. Therefore, workers with these conditions who are required to wear a respirator should consult their doctors to help determine whether respirator use is advisable for them.

4. Do nothing to reduce or eliminate the hazard from a work area. They merely filter the air inhaled or provide fresh air. Respirators only prevent you from inhaling contaminants once the air has become dirty.

- Respirators should only be used:

1. When engineering controls are not possible.

2. When engineering controls are not sufficient to reduce exposure.

3. On a temporary basis while a company is waiting to install engineering controls (e.g., local exhaust ventilation, enclosure of a process).

4. During short-term maintenance procedures.

Instructions	Health Messages	Materials/Notes
	5. During emergency procedures.	
	• Make sure the respirator you use has been certified by the National Institute for Occupational Safety and Health (NIOSH).	
	• For more information on respiratory protection, ask your regional OSHA office to send you copies of OSHA's Standard (29 CFR 1910.134) and the American National Standards Institute (ANSI Z88 -1980).	
2. Give students Handout No. 9.	• Use this handout to remind you of the basic information you need to know about the proper use of respirators in the auto body and repair shop.	Handout No. 9 — "Six Facts You Must Know About Respirators"

Session IV:

Protecting your health in the auto body and repair shop through problem-solving

Objectives:

Cognitive: Students will be able to:

- Identify at least four steps workers can take if exposure to a breathing hazard in the auto body and repair shop is suspected given a hypothetical situation. (Higher Order Thinking Skills)
- Identify attitudes that help or hinder health and safety in the auto body and repair shop given a hypothetical situation. (Higher Order Thinking Skills)

Affective: Students will be able to:

- Express their feelings regarding the importance of solving health and safety problems in the auto body and repair shop if they suspect exposure to a breathing hazard.

Skills: Students will be able to:

- Apply problem-solving skills related to exposure to a breathing hazard in the auto body and repair shop. (Higher Order Thinking Skills)

Activities	Materials Needed	Estimated time
A. Discussion — Attitudes that help and hinder health and safety in the auto body and repair shop	Handout No. 10a — "Attitudes That Help" Handout No. 10b — "Attitudes That Hinder"	15 Minutes
B. Discussion — What to do if you think you're being exposed to a breathing hazard in the auto body and repair shop	Worksheets Nos. 5a, 5b, 5c, 5d — — "Scenarios" Handout No. 11 — "What to Do If You Think You're Being Exposed to a Breathing Hazard at Work"	30 Minutes
		TOTAL: 45 MINUTES

Activity A: Discussion

Attitudes that help and hinder health and safety in the auto body and repair shop

1. Give students Handouts No. 10a and 10b.
2. Conduct a brief discussion with students on attitudes that help and hinder safety off the job.

   Convey all health messages.

   Ask students:
   - How many of you wear seat belts when driving in or riding in a car?
   - How many of you cross the streets against the light?
   - How many of you smoke when using chemicals while you work on your car at home?

   For each ask:
   - Which attitude(s) best describes why you do or do not do this?

- Your attitudes toward safety and health may influence whether you are willing to take precautions against breathing hazards in the auto body and repair shop.
- Your attitudes may also affect how you feel about encouraging other workers to avoid risks in the shop.
- Be aware of how off- and on-the-job attitudes may be affecting your health and safety at school and at work.

Handout No. 10a — "Attitudes That Help"

Handout No. 10b — "Attitudes That Hinder"

Instructions

Health Messages

Materials/Notes

3. Conduct a brief discussion with students on attitudes that help and hinder safety in the shop. Convey all health messages.

   Ask students:
   - If ventilation is inadequate, how many of you always wear a respirator when exposed to toxic chemicals? For example, when sanding or grinding paints and primers?
   - How many of you always read the labels before using new chemicals in the shop?
   - How many of you regularly check to see if the local exhaust system is working in your work area?

   For each ask:
   - Which attitude(s) best describes why you do or do not do this?

Activity B: Discussion

What to do if you think you are being exposed to a breathing hazard in the auto body and repair shop

Instructions

1. Divide students into four groups. Give each group one scenario.
2. Ask each group to appoint a recorder to write down the answers to the questions in the scenario.
3. Give students 10 minutes to answer questions.
4. Reassemble students.
5. Ask each recorder to read scenario and solutions.
6. Ask class to add solutions not mentioned.
7. Record solutions on chalkboard.
8. Summarize common steps students identified.

Health Messages

- The Occupational Safety and Health Act (OSHAct) guarantees a "safe and healthful workplace" to all working people.
- The law was passed in response to an increased recognition of high rates of disease and injury in American workplaces.
- Enforcement of the law is difficult and is an issue of concern to all of us as workers.
- Workers play an important role in the enforcement process.
- Let's generate a list of steps a worker might take to see that his or her right to a safe and healthful workplace is being carried out. To do this let's discuss some real life situations that could happen in the auto body and repair shop.

Materials/Notes

Worksheets Nos. 5a, 5b, 5c, 5d — "Scenarios"

9. Give Students Handout No. 11.

- What to do if you think you are being exposed to a breathing hazard at work:

  1. Find out about the hazard.
     - Consult the warning label.
     - Consult the MSDS.
     - If still in doubt about a chemical, call the National Institute for Occupational Safety and Health (NIOSH) at 1-800-35-NIOSH. They can answer your questions and also provide you with reference information on specific hazards and control methods.
  2. Find out what's presently being done about the hazard and whether it is appropriate.
     - Ask to see the company's HazCom Program.
  3. Document any symptoms you are having which may be a result of exposure to the hazard.
     - Keep a record of when they occur and if they go away on weekends or vacations.
     - Ask co-workers if they are having similar symptoms.
     - See a doctor about tests that might be available to determine if overexposure has occurred.

Handout No. 11 — "What to Do If You Think You're Being Exposed to a Breathing Hazard at Work"

4. Talk to your supervisor and/or other company personnel about the problem.

5. Contact the health and safety representative for your union if you are a member of one.

6. Seek additional outside help.

    - You have a right to anonymously request an inspection of your work area if you suspect you are being exposed to a breathing hazard.

    - Call your union representative, if you are a member of one, or your nearest OSHA office to find out the procedure for requesting an inspection.

Glossary of terms

ACGIH — American Conference of Governmental Industrial Hygienists.

Acute Effect — An adverse effect upon the human body following a short exposure to a dangerous substance or material. An acute reaction or illness occurs immediately after exposure or over a short term (usually less than 24 hours).

Aerosols — Liquid droplets or solid particles dispersed in air that are of fine enough particle size (0.01 to 100 micrometers) to remain so dispersed for a period of time.

AIHA — American Industrial Hygiene Association.

Air Monitoring — The sampling for and measuring of pollutants in the atmosphere.

Alveoli — Tiny air sacs in the lungs.

Asphyxiant — Something that prevents you from breathing or using oxygen.

Asthma — A lung disease in which the air tubes of the lungs are temporarily narrowed by tightened muscles, excess mucus and inflammed or swollen tissue. During an asthma episode, people may experience wheezing, coughing and difficulty in breathing. Asthma episodes can happen anytime and may be mild or severe.

Carcinogens — Substances or agents that can cause cancer when people or animals are exposed to them.

Caustic — A corrosive chemical with a high pH (base or alkaline). This chemical can destroy tissue.

Ceiling Limit — The maximum concentration of a chemical, dust, or physical agent that is allowed at any time under federal standards.

Cells — The building blocks of the body.

Central Nervous System (CNS) — Body system made up of the brain and spinal cord.

Chemical Name — The correct name that fully defines the chemical composition of a substance. "Benzene" and "3,3-dimethozybenzidine" are chemical names; "Magic Solve" and "Red ECBS" are trade names. The generic name is frequently referred to as the exact description, but it actually refers to categories such as metals or solvents.

Chromosome -- Part of the cell's genetic material. Damage to chromosomes can cause harmful changes to an individual's body and may also result in birth defects.

Chronic Bronchitis — A chronic inflammation (swelling) of the airways (bronchial tubes) due to infection or tissue damage.

Chronic Effect — An adverse effect upon the human body which develops from a long term or frequent exposure to a harmful substance such as a carcinogen. Chronic effects or diseases may not show up for years after exposure.

Cilia — Tiny hairs lining the inside of the airways that stroke upward removing small particles from the lungs.

Combustible — A term generally used to describe any material, chemical, or substance that can burn; for classification purposes combustible solids are materials that are comparatively difficult to ignite and combustible liquids have a flash point of 100F or above.

Comfort Zone - Average — The range of effective temperatures over which the majority (50% or more) of adults feel comfortable.

Concentration — The amount of a chemical, dust or other substances in a given amount of air. Example: 50 micrograms of lead in one cubic meter of air is the concentration, (50 ug/m3).

Contaminant — Poison, toxic substance — anything that makes air, food or water dirty or unfit for human consumption.

Contact Dermatitis — (See Dermatitis) Dermatitis of the skin due to direct contact with irritating substance.

Corrosive — Any solid, liquid or gas that disolves metal, burns or destructively attacks living tissue or another substance. Corrosive chemicals, such as strong acids, alkalis and caustics, can cause burns and irritation when in contact with human skin.

Dermatitis — Inflammation of the skin, such as redness, rash, dry or cracking skin, blisters, swelling, or pain. May result from exposure to toxic or abrasive substance.

Dilution Ventilation — The addition of fresh air to a room to keep concentrations of contaminants below a certain level. A general system is not very effective in controlling hazards, since it relies merely on fresh air to dilute harmful substances.

Dust — Airborne solid particles that are created by work processes, such as grinding or pulverizing.

Emphysema — A severe disease in which the walls of the air sacs in the lungs stretch and break. The results are balloon-like spaces in the lungs where little exchange of oxygen and carbon dioxide can take place. People with severe emphysema find every breath a difficult one.

Engineering Controls — Prevention of worker exposure to contaminants by production design or ventilation, rather than by forcing workers to wear protective equipment. OSHA regulations require exposure to airborne contaminants to be handled by engineering controls rather than by the use of respirators wherever possible.

Etch — To cut or eat away material with acid or other corrosive substance.

Exhaust Ventilation — (Also known as Local Exhaust Ventilation) It removes air contaminants from workplace air by sucking them away near their sources by means of hoods, canopies, or ducts. Exhaust ventilation is the most efficient means of controlling air contaminants because it moves smaller air volumes with less heat loss (in winter) than general exhaust ventilation.

Explosive Level — The concentrations of gas in air which can explode. It is usually expressed as a range between a "lower explosive level" (LEL) and an "upper explosive level" (UEL). It is commonly measured by an explosimeter which reads out the concentration of a possibly dangerous gas in percent per volume.

Lower Explosive (Flammable) Limit — The lowest concentration of a combustible flammable gas or vapor in air that will produce a flash or fire. Mixtures below this concentration are too "lean" to burn.

Upper Explosive (Flammable) Limit — The highest concentration of a combustible flammable gas or vapor in air that will produce a flash or fire. Mixtures above this concentration are too "rich" to burn.

Exposure — When a worker takes in a toxic substance by breathing, eating, skin absorption or other means, he or she is exposed to that substance. Exposure is measured over time and in amounts (dose).

Filter, HEPA — High efficiency particulate air filter that is at least 99.97% efficient in removing thermally generated particles with a diameter of 0.3u.

Flammable — A term generally used to describe a material that is comparatively easy to ignite and that burns rapidly; for classification purposes, a flammable liquid is a material that has a flash point below 100F.

Flash Point — The lowest temperature at which a liquid gives off enough vapor to form an ignitable mixture with air and produce a flame when a source of ignition is present.

Fume — Small particles that become airborne when a solid material is heated or burned. Example: Welding or lead solder creates lead fumes.

Gas — A formless shapeless state of matter similar to air which can be changed to a liquid or solid state only by the combined effect of pressure and temperature. Examples: Carbon monoxide, oxygen and hydrogen sulfide.

General Ventilation — Lessens airborne contamination by diluting workplace air by ceiling or window fans.

Generic Name — The correct name for a whole group or class of substances which have similar characteristics.

Halogenated — Compound that contains a member of the halogen group of elements: flourine, chlorine, bromine, iodine.

Hazard Abatement — The process of controlling and eliminating hazards.

Hazard Communication Standard — The standard created by OSHA that requires employers to inform and train workers about the hazards of chemicals they handle.

HazCom Program — The training program that employers must provide to workers concerning the safe handling of toxic chemicals.

Hazardous Material — A substance or material which, if handled improperly, has the potential of causing harm to health, property or the environment.

Hazardous Waste — Waste material regulated by the Resource Conservation and Recovery Act (RCRA) as a substance that can cause harm to human health or the environment if handled improperly.

Health Hazard — Any type of job-related noise, dusts, gases, toxic chemicals, substances, or dangerous working condition which could cause an accident, injury, disease or death to workers.

Industrial Hygiene — The technical specialty concerned with the recognition, evaluation and elimination of workplace hazards. Industrial hygienists study ventilation techniques and other engineering controls, as well as methods for determining the identity and concentration of chemical, physical and radiation hazards.

Inflammable — Means the same thing as flammable: a material that can burn easily.

Inflammation — A condition of the body or portion of the body characterized by swelling, redness, pain and heat.

Ingestion — The process of taking a substance through the mouth.

Inhalation — The process of breathing something into the lungs.

Isolation or Enclosure — The isolation of a dangerous process by moving it to one part of the plant and providing it with special protective features. For example, special booths for spray painting can be used to protect workers against paint fumes.

Latent Period — The time that elapses between exposure and the first manifestation of damage.

Local Effect — Means that the action of the chemical takes place at the point of contact, such as dermatitis caused by skin contact with solvents. (Compare with systemic effect).

Material Safety Data Sheet — Product specific sheet prepared by the product's manufacturer to provide information regarding the product's potential hazards and preventative procedures.

Mg/Ms — Milligrams per cubic meter of air. A unit for measuring the amount or density of a chemical or substance in the air.

Mist — Airborne liquid droplets that are created by a gas going into the liquid state or by a liquid foaming, being splashed or atomized. Examples: oil mist from cutting, grinding, or from pressure: paint mists from spraying.

Mucous Membrane — The moist, soft covering of the nose, mouth and lining of eyes.

Mutation — A change (usually harmful) in the genetic material of cell. When it occurs in the sperm or egg, the mutation can be passed on to future generations.

NIOSH — National Institute for Occupational Safety and Health, U.S. Public Health Service. NIOSH is responsible for conducting research to make America's workplaces healthier and safer.

OSHA — Occupational Safety and Health Administration, U.S. Department of Labor. This is a federal agency which sets and enforces regulations governing occupational exposures of workers.

PEL — Permissible Exposure Limit — the highest average concentration of a substance in the air that a worker can safely be exposed to over an eight-hour work period. A low PEL indicates a substance is very toxic. For example, the PEL for benzene is 1 ppm. Compare this with the PEL for acetone which is 250 ppm. The PEL is a legal limit.

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Personal Protective Equipment — Devices worn by workers to protect them against work-related hazards such as air contaminants, falling materials, and noise. While it is important to wear such equipment when required, it should be remembered that these devices usually only provide minimal protection to workers and should only have to be worn when all other efforts have been initiated to correct an unsafe working environment. Examples of personal protective equipment include hard hats, ear plugs, respirators and steel toe work shoes.

PPM — Abbreviation for parts per million; the ratio of the amount of a substance to the amount of air. 1 part benzene vapor per million parts of air = 1ppm.

Process Change — The changing of an entire process to protect workers against breathing hazards. For example, brush painting or dipping can replace spray painting. Some metals can be joined by crimping instead of welding.

Reactivity — An indication of the stability of a chemical when exposed to normal environmental conditions.

Route of Entry — The path by which chemicals can enter the body. There are 3 main routes of entry; inhalation, ingestion, and skin absorption.

Scavenger cell or macrophages (mak-ro-fajes) — Cells that move through the lung tissue and digest particles that get past the nose, throat, and upper airways, and deeper into the lungs. They cannot destroy all particles.

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Secondhand Smoke — Has two major components.

Mainstream smoke — which the smoker pulls through the mouthpiece when he or she inhales or puffs and then exhales into the air.

Sidestream smoke — is from the burning end of the cigarette which a nonsmoker inhales whenever he or she is around someone who is smoking. Sidestream smoke actually has higher concentrations of some harmful compounds then the mainstream smoke inhaled by the smoker

Sensitizer — A substance that causes an individual to react when subsequently exposed to the same or other irritant, as in a skin reaction or allergy.

Short-Term Exposure Limit (STEL) — A standard for the permissible occupational exposure limit for a brief time (not over 15 minutes). Usually only four short exposures a day are permitted, each at least 60 minutes apart.

Solvent — Any substance, but usually a liquid, that is used to dissolve another substance. Solvents are used in the autobody and repair shop to remove grease from parts and to soften coatings such as paints.

Synergistic — When two agents are taken together, the harmful effect is far greater than the sum of effects when each is taken separately.

Systemic Effect — A chemical's effect on the body that takes place somewhere other than at the point of contact. For example, some pesticides are absorbed through the skin (point of contact), but affect the nervous system (site of action).

Teratogen — Substances or agents that cause birth defects in offspring.

Threshold Limit Value (TLV) — The ACGIH recommended limit allowed for worker exposure to toxic chemicals, substances, and airborne contaminants. It is believed that a worker can be repeatedly exposed to the TLV without adverse effects. However, in many cases the current TLV's are not set low enough to protect workers or their offspring. This is a recommendation only, not a legal limit.

Time Weighted Average (TWA) — Most OSHA standards are for exposure over eight hours, TWA, using time-integrated sampling.

Toxic — Poisonous, capable of causing any sort of injury to the body. This includes noise, radiation, heat, cold, along with chemical and mineral substances.

Trade Name — Any arbitrary name a company chooses to use for a chemical or product for advertising reasons or in order to keep secret the ingredients. "Formacil" or "Methotrexate" are trade names. See generic names and chemical names.

Ug/M3 — Micrograms per cubic meter of air, 100 micrograms equal one milligram.

Ventilation — A duct and fan system that takes fumes, vapors or dust in the air out of the work areas, thereby reducing worker's exposure. The most effective type of ventilation is local exhaust ventilation, placed close to the source of airborne fumes or dust and drawing it away from the worker.

Volatile — Tendency for a liquid to evaporate or vaporize rapidly.

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Handouts

Auto Body and Repair

2160

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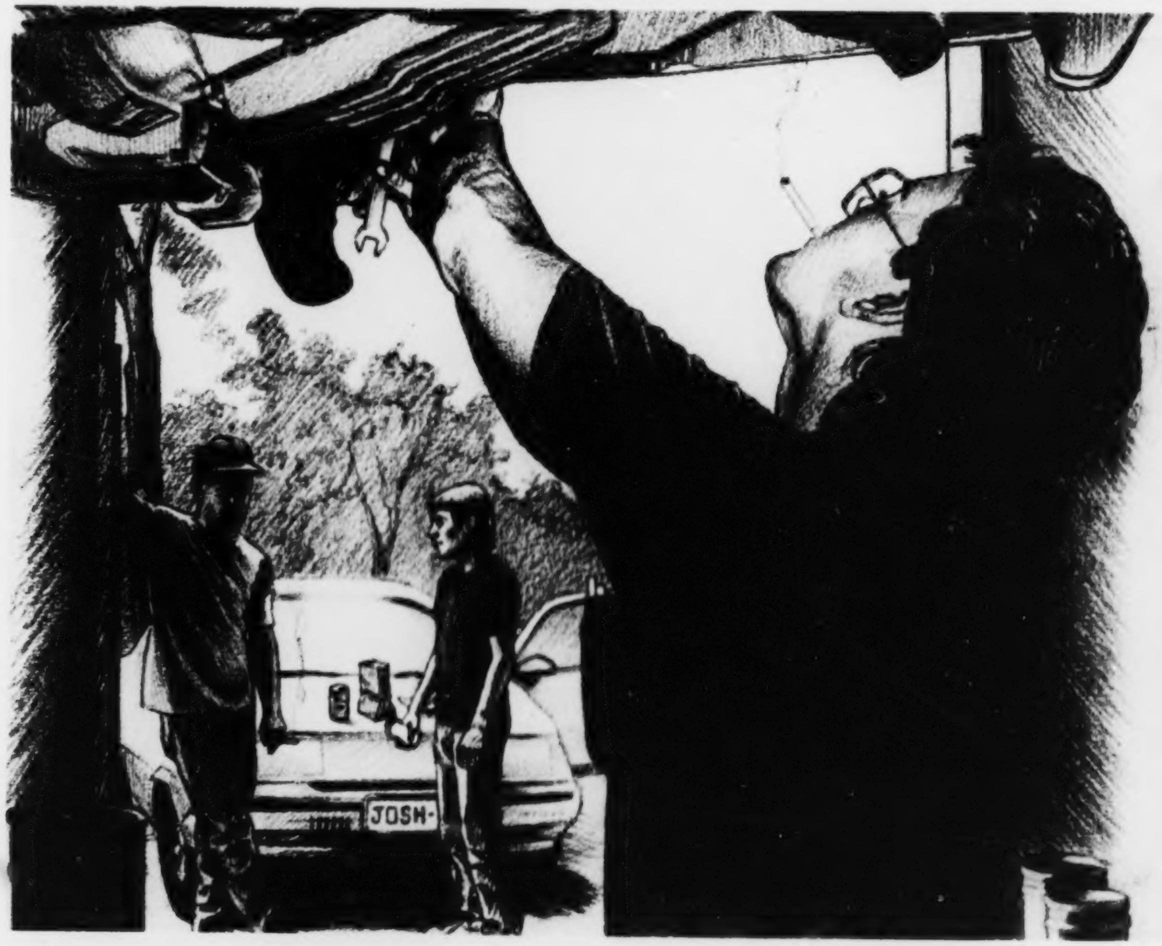
What's Wrong With This Picture?



Circle what's wrong. Explain why.

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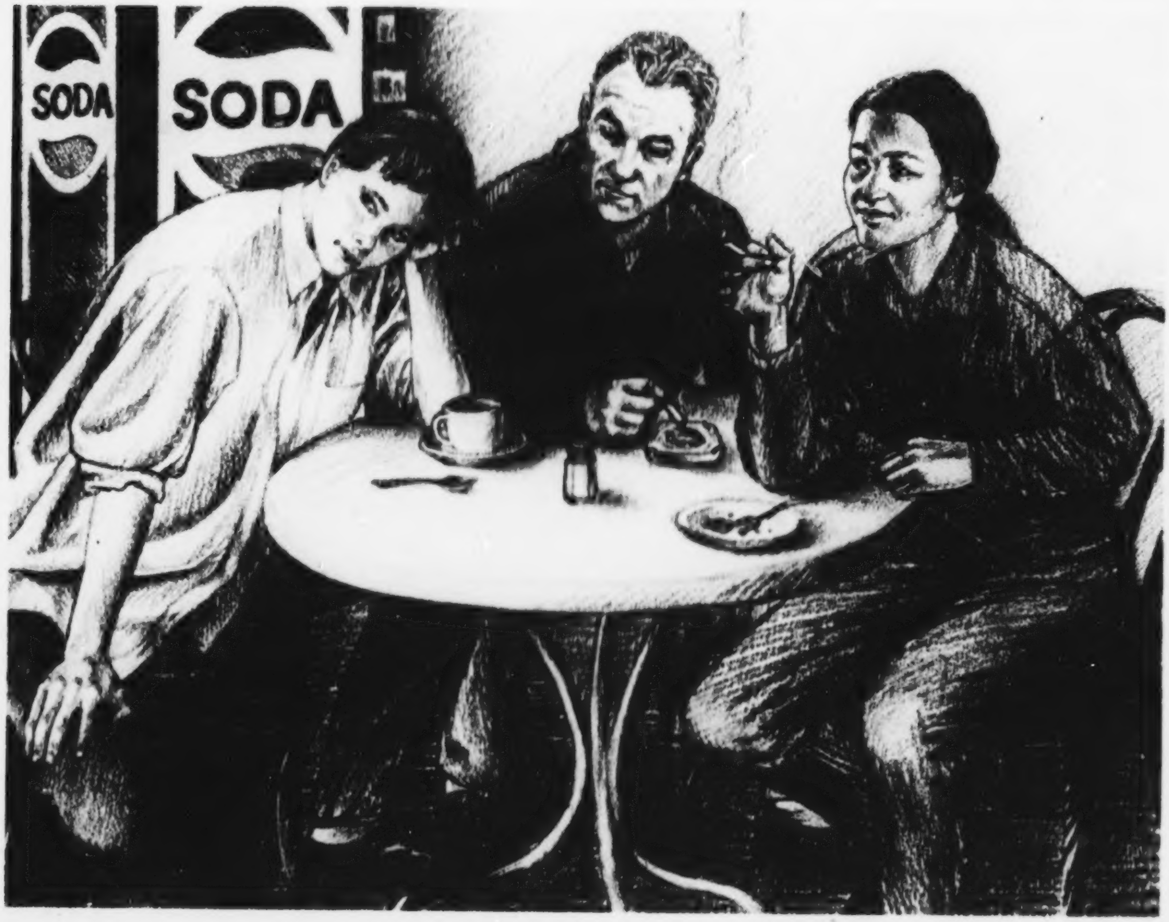
Story of Beth



Beth has worked as a mechanic at Enson's Auto Body and Repair since graduating from high school about five years ago. She recently quit smoking and wants to work in a smoke-free environment. Smoking is still allowed in some areas of the shop where she works, including the lunch room. What can she do?

List your solutions.

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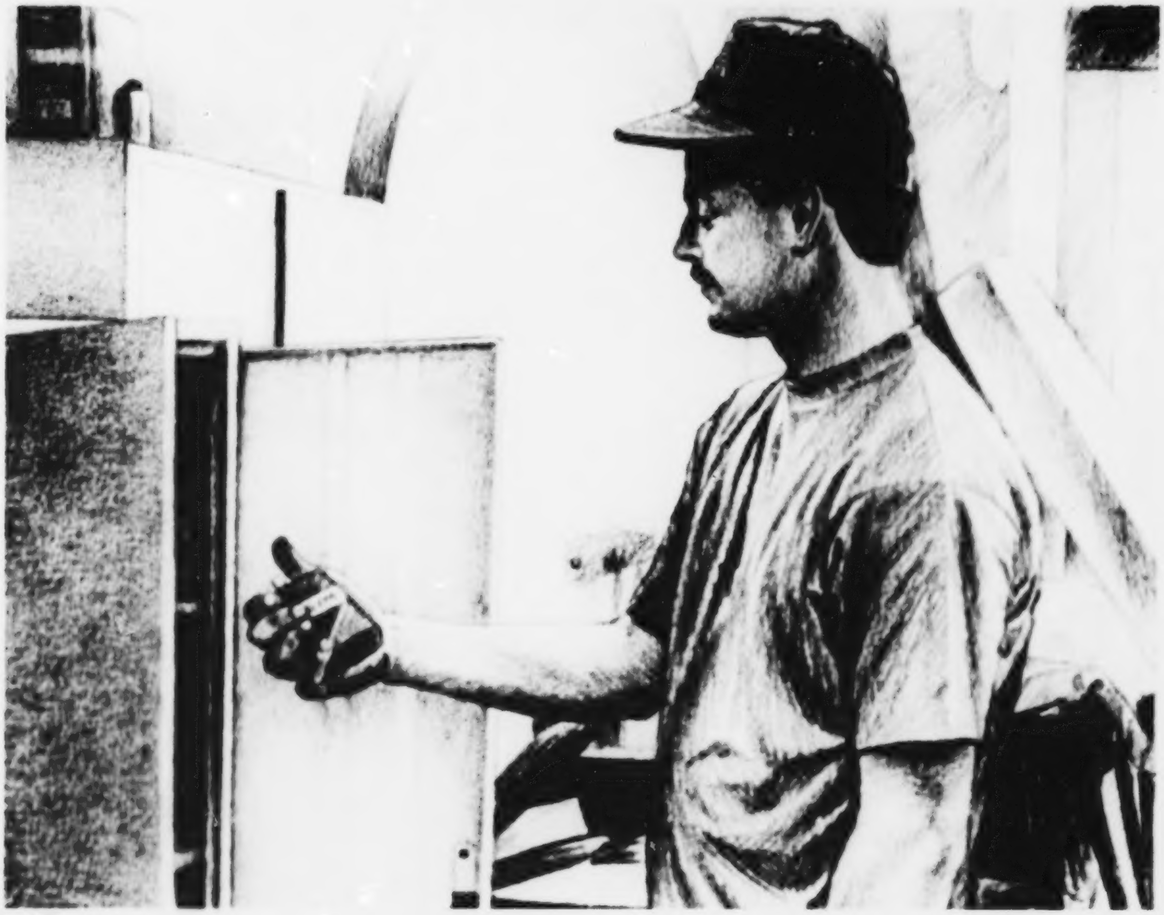
Story of Ray



Ray does auto body work at A.J. Fender Repair, Inc. He is a smoker who is aware that smoking is particularly hazardous in the auto body shop. Since he is unable to quit, what can he do to protect himself from the harmful effect of smoking and other toxic substances at work?

List your solutions.

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Sample Worksite Smoking Policy

Purpose:
Dillon's Auto Body is dedicated to providing a healthful, comfortable and productive work environment for its workers. Secondhand smoke, or involuntary smoking, can be cause of disease, including lung cancer, in healthy nonsmokers. The simple separation of smokers and nonsmokers within the same air space may reduce, but does not eliminate, the exposure of nonsmokers to environmental tobacco smoke. This goal can only be achieved by protecting nonsmokers from secondhand smoke and by helping workers adjust to not smoking at work. Therefore, effective ______________ 1, 199______, the Dillon's Auto Body Company shall be entirely smoke-free.

Smoking Will Be Srictly Prohibited Within Company Owned or Leased Buildings Including:

- any area where a fire or safety hazard exists
- company vehicles
- common work areas
- manufacturing areas
- private offices
- elevators, hallways, lobbies
- lunch rooms
- rest rooms
- meeting rooms

This policy applies to all workers, clients, contractors and visitors.

This policy is being announced six months in advance of complete implementation and will be phased in over a period of six months to facilitate a smooth transition to a smoke-free workplace.

Assistance for Smokers:
Surveys reveal that more than 2/3 of smokers want to quit. Workers who smoke and want assistance in quiting are encouraged to participate in the American Lung Association's stop-smoking programs offered by this company.

Enforcement:
The success of this policy will depend upon the thoughtfulness, consideration and cooperation of smokers and nonsmokers. All workers share in the responsibility for adhering to and enforcing the policy. Any problems should be brought to the attention of the appropriate supervisor and handled through the normal chain of command. Workers who violate this policy will be subject to the same disciplinary actions that accompany infractions of other company rules.

Company President Dillon's Auto Body ______________________ Date ______________

Remember:
The best method of protecting workers from the dangerous consequences of tobacco smoke is to create a totally smoke-free environment.

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The Major Breathing Hazards in the Auto Body and Repair Shop

Process	Breathing Hazard	Health Effects
Body Repair	Fiberglass and polyester resin containing styrene	(Fiberglass) • Skin, eye, nose and throat iritation, temporary shortness of breath • When inhaled may cause lung damage (Styrene) vapors irritate eyes, nose and airways and cause severe itching and tearing. High levels cause headaches, drowsiness and fatigue. Prolonged exposure may cause blood, liver, and possible reproductive damage
	Welding fumes and gases	Metal Fume Fever — flu-like symptoms which develop 4-12 hours after exposure to metal fumes during welding, brazing or cutting. Welding gases (nitrogen oxide and ozone) are lung irritants. Welders are also at a higher risk of developing bronchitis, emphysema and lung scarring. Exposure to nickel and chromium fumes generated during arc welding of stainless steel may be associated with increased risk of lung cancer. Be sure to be alert to early signs of irritation to fumes and gases, they may be a sign of ventilation problems
	Chromic acid and Chrome metal fumes	• It is a severe irritant and causes ulceration of mucous membranes. Hexavalant chromium is suspected of causing cancer • Skin damage, perforation of nasal septum

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The Major Breathing Hazards in the Auto Body and Repair Shop

Process	**Breathing Hazard**	**Health Effects**
Prepairing to paint	Epoxy resins	• Skin rashes and respiratory irritant
Painting	Isocyanates and partially polymerized polyurethanes	• Isocyanates can cause respiratory sensitization leading to a chronic asthma-like condition
	Chromates (primarily lead and zinc chromates)	• Skin and nasal irritation • Skin ulceration and lung cancer
Clean-up	Solvents Always check the label to determine health effects and proper precautions. Some solvents are more hazardous and require greater precautions.	• Eye and skin irritatation and dermatitis • Headache, dizziness, nausea, sleepiness • Prolonged exposure can cause permanent damage to nervous system, kidneys and liver, cancer and reproductive damage • In a confined space with poor ventilation — unconsciousness, death
Engine tuning and repair	Carbon monoxide	• Weakness, nausea, dizziness, headache, blurred vision • Loss of memory and visual sharpness • High concentration is fatal
Radiator and Electrical Repair	Lead and silver solder (Cadmium)	• Irritability, sleep loss, joint pain • Damage to blood components, anemia, damage to brain and nervous systems, sterility and birth defects

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The Major Breathing Hazards in the Auto Body and Repair Shop

Process	Breathing Hazard	Health Effects
Battery Cleaning, Repair and Charging	Sulfuric acid mists	• Irritation to skin, mucous membranes, and lungs, difficulty breathing • Tooth decay, lung disease
Brake and Clutch Repair	Asbestos	• Irreversible lung scarring (asbestosis), lung cancer, rare cancer of chest and abdominal cavity
Making new parts, replacing parts	Cutting oil fumes and oil smoke	• Skin and respiratory irritation • Possible skin, stomach and lung cancer • Lung irritation leading to chemical pneumonia
	Zinc and copper fumes	• "Metal fume fever," a flu-like condition with symptoms of fatigue, nausea, fever and cough that lasts several days • Chronic cough and shortness of breath

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The Major Breathing Hazards in the Auto Body and Repair Shop (Teacher's Version)

Process	Breathing Hazard	Major Source(s)	Health Effects	Methods of Protection
Body Repair	Fiberglass and polyester resin containing styrene	Filler in body work, firewall insulation, components of glass-pack mufflers Before fillers harden, styrene vapor may be inhaled	(Fiberglass) • Skin, eye, nose and throat iritation, temporary shortness of breath • When inhaled may cause lung damage (Styrene) vapors irritate eyes, nose and airways and cause severe itching and tearing. High levels cause headaches, drowsiness and fatigue. Prolonged exposure may cause blood, liver, and possible reproductive damage	• Local exhaust ventilation with hood • Make sure exhaust system is pulling air away from body not toward it • Wear dust respirator when sanding or grinding fillers
	Welding fumes and gases	Arc and torch, welding, brazing, torch cutting in body work	Metal Fume Fever — flu-like symptoms which develop 4-12 hours after exposure to metal fumes during welding, brazing or cutting. Welding gases (nitrogen oxide and ozone) are lung irritants. Welders are also at a higher risk of developing bronchitis, emphysema and lung scarring. Exposure to nickel and chromium fumes generated during arc welding of stainless steel may be associated with increased risk of lung cancer. Be sure to be alert to early signs of irritation to fumes and gases, they may be a sign of ventilation problems	• Always find out what ingredients are in the base metal, electrode, or wire filler • Use less hazardous materials (i.e. — cadium-free silver solder) • Local exhaust ventilation with hood • Make sure exhaust system is pulling air away from body not toward it • Where ventilation is not adequate or if welding in a confined place, wear a NIOSH-approved fume or supplied-air respirator. The exact type will depend on the fumes, gases and dust generated in the welding process • Wear protective clothing
	Chromic acid and Chrome metal fumes	Plating, metal cleaning Welding on stainless steel or chrome	• It is a severe irritant and causes ulceration of mucous membranes. Hexavalant chromium is suspected of causing cancer • Skin damage, perforation of nasal septum	• Local exhaust ventilation with hood • Make sure exhaust system pulls air away from the body, not toward the body • Where ventilation is inadequate and workers are exposed to a carcinogen, NIOSH recommends that only the most protective respirator be used, starting with an air supplying respirator • Wear protective clothing

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The Major Breathing Hazards in the Auto Body and Repair Shop

Process	**Breathing Hazard**	**Major Source(s)**	**Health Effects**	**Methods of Protection**
Prepairing to paint	Epoxy resins	Patching compounds	• Skin rashes and respiratory irritant	• Local exhaust ventilation with hood. Exhaust system should pull air away from body not toward it • Where ventilation is inadequate, use an organic vapor respirator • Rubber gloves for patching compounds
Painting	Isocyanates and partially polymerized polyurethanes	Polyurethane paints (enamel, varnish, topcoats), primers	• Isocyanates can cause respiratory sensitization leading to a chronic asthma-like condition	• Local exhaust ventilation with hood. Exhaust system should pull air away from the body, not toward it • Where ventilation is inadequate, use an organic vapor respirator • Special booth for spray painting • When grinding, sanding, mixing or spraying paints containing isocyanates, wear a positive pressure air supplying respirator even in spray booth. Check the label and/or the Material Safety Data Sheet and follow instructions for personal protective equipment
	Chromates (primarily lead and zinc chromates)	Pigments in brightly colored paints, primers	• Skin and nasal irritation • Skin ulceration and lung cancer (NIOSH-carcinogen)	• Local exhaust ventilation with hood. Exhaust system should pull air away from the body, not toward it • Where ventilation is inadequate and workers are exposed to a carcinogen, NIOSH recommends that only the most protective respirator be used, starting with an air supplying respirator • Special booth for spray painting • Rubber gloves for patching compounds

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The Major Breathing Hazards in the Auto Body and Repair Shop

Process	Breathing Hazard	Major Source(s)	Health Effects	Methods of Protection
Clean-up	Solvents Always check the label to determine health effects and proper precautions. Some solvents are more hazardous and require greater precautions.	Paint and glue thinners, cleaning agents	• Eye and skin irritatation and dermatitis • Headache, dizziness, nausea, sleepiness • Prolonged exposure can cause permanent damage to nervous system, kidneys and liver, cancer and reproductive damage • In a confined space with poor ventilation — unconsciousness, death	• Use less-hazardous materials (i.e., chloroethane instead of trichloroethylene) • Local exhaust ventilation with hood • Where ventilation is inadequate, use an organic cartridge respirator • Goggles — particularly when degreasing parts or spray painting where splashing may occur • Wear protective rubber gloves — check label for correct gloves • Solvent tank should be equipped with exhaust system to outside of building • Do not smoke or use solvents around open flame • Use proper storage and disposal methods • NEVER wash hands with solvents • Clean up spills immediately • Flush eyes for 15 minutes with water if solvent splashes in the eye
Engine tuning and repair	Carbon monoxide	Gasoline and diesel exhaust from heaters, cigarette smoke, certain paint removers (those containing methylene chloride)	• Weakness, nausea, dizziness, headache, blurred vision • Loss of memory and visual sharpness • High concentration is fatal	• Local exhaust ventilation with hood. • Make sure exhaust system is pulling air from body, not toward it • Exhaust ventilation hose that hooks to tailpipe. Make sure hose pumps exhaust outside or underground • Don't smoke
Radiator and Electrical Repair	Lead and silver solder (Cadmium)	Soldering and brazing operations; used as filler in radiator repair; (primers, dryers, fillers)	• Irritability, sleep loss, joint pain • Damage to blood components, anemia, damage to brain and nervous systems, sterility and birth defects	• Use less-hazardous materials (i.e., cadmium-free silver solder) • Local exhaust ventilation with hood • Make sure exhaust system is pulling air away from body, not toward it • Wear protective equipment • When local exhaust ventilation is not adequate, use a fume-filter cartridge respirator • Protective goggles with a shade number of at least 4 • Use leather protective gloves to handle hot metals

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The Major Breathing Hazards in the Auto Body and Repair Shop

Process	**Breathing Hazard**	**Major Source(s)**	**Health Effects**	**Methods of Protection**
Battery Cleaning, Repair and Charging	Sulfuric acid mists	Battery recharging equipment	• Irritation to skin, mucous membranes, and lungs, difficulty breathing • Tooth decay, lung disease	• Local exhaust ventilation with hood • Make sure exhaust system is pulling air away from body, not toward it • Full face cartridge respirator with acid gas cannister • Wear rubber gloves • No smoking — the hydrogen that comes from charging is explosive!
Brake and Clutch Repair	Asbestos	Brake and clutch repair, brake shoes, or disc pads found in old inventory, older cars, even newer cars with special application	• Irreversible lung scarring (asbestosis), lung cancer, rare cancer of chest and abdominal cavity	• Local exhaust ventilation with hood • Make sure exhaust system is pulling air from body, not toward it • High Efficiency Particulate Air (HEPA) vacuum for arcing, grinding or drilling of asbestos brake shoes and clutches • Where ventilation is inadequate (no HEPA vacuum) use air supplying or a powered air purifying respirator with a high-efficiency particulate filter approved for asbestos • Never use compressed air to clean brake or clutch linings • For clean-up use wet mop. Never dry sweep • Sealed and labelled bags or containers for dust collection • Use disposable suit when doing asbestos brake and clutch work
Making new parts, replacing parts	Cutting oil fumes and oil smoke	Machine operations, such as making new shafts on a metal lathe, drill press operations. Burnoff from oily engines releases oil smoke.	• Skin and respiratory irritation • Possible skin, stomach and lung cancer • Lung irritation leading to chemical pneumonia	• Small area fan that blows fumes away from the breathing zones of the lathe or drill press operator • Where ventilation is inadequate and workers are exposed to a carcinogen, NIOSH recommends that only the most protective respirator be used, starting with an air supplying respirator
	Zinc and copper fumes	Welding, brazing or torch cutting of galvanized metals	• "Metal fume fever," a flu-like condition with symptoms of fatigue, nausea, fever and cough that lasts several days • Chronic cough and shortness of breath	• Local exhaust ventilation with hood • Make sure exhaust system is pulling air away from body, not toward it • Wear a dust respirator when sanding or grinding fillers • Always find out what ingredients are in the base metal, and electrode or wire fillers

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Checklist for Health and Safety in the Auto Body and Repair Shop

Use this mental checklist to help you decide if your worksite is safe and healthful

___ **Is the work area clean?**
- no spills, or oily rags
- chemicals are clearly labeled and stored properly

___ **Do workers eat or drink in the work area?**

___ **Is smoking allowed on the premises?**

___ **Are local exhaust ventilation systems with hoods available and in use?**
- adequate — one in each major work area
- working properly — move air away from body, not toward it

___ **Is there an exhaust ventilation system available and in use?**
- exhaust pipe hooks to exhaust system that moves air outside of building

___ **Is the solvent cleaning tank equipped with an exhaust system vented directly to the outside of the building?**

___ **Is there a specially designed booth available for spray painting?**

___ **Is a High Efficiency Particulate Air (HEPA) vacuum used for cleaning and repair of asbestos brake linings and clutches?**
- asbestos dust is removed and sealed in containers or bags
- labeled and disposed of at approved hazardous waste dump

___ **Do workers use compressed air to clean asbestos brake or clutch linings (wrong way)?**

___ **Do workers wet mop (right way) rather than dry sweeping (wrong way)?**

___ **Do workers wash their hands before eating, drinking or smoking with soap and water or waterless hand cleaners (right way)?**

___ **Do workers wash their hands with solvents (wrong way)?**

___ **Is protective equipment available and in use?**
- a NIOSH-approved respirator for each chemical that requires respirator use
- gloves
- goggles
- head protection
- aprons
- other (describe) ____________________

  ____

  ____

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What to Look For On A Warning Label

INSTRUCTIONS: Draw a line to connect the type of information to look for on a warning label to the type of information available in the sample provided.

Name of chemical

Physical hazards

Health hazards

Recommendations for safe use

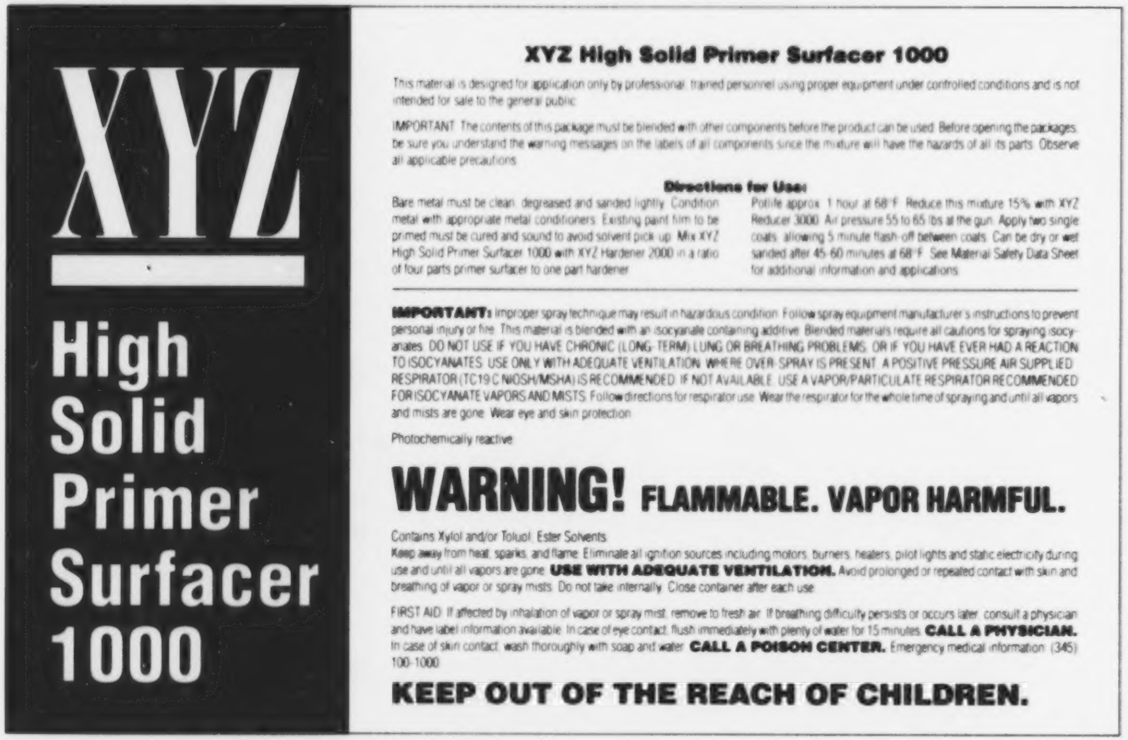
First aid instructions

Personal protective equipment needed

Fire-fighting equipment

How to clean up spills properly

Correct disposal procedures



XYZ

High
Solid
Primer
Surfacer
1000

XYZ High Solid Primer Surfacer 1000

This material is designed for application only by professional, trained personnel using proper equipment under controlled conditions and is not intended for sale to the general public.

IMPORTANT: The contents of this package must be blended with other components before the product can be used. Before opening the packages, be sure you understand the warning messages on the labels of all components since the mixture will have the hazards of all its parts. Observe all applicable precautions.

Directions for Use:

Bare metal must be clean, degreased and sanded lightly. Condition metal with appropriate metal conditioners. Existing paint film to be primed must be cured and sound to avoid solvent pick-up. Mix XYZ High Solid Primer Surfacer 1000 with XYZ Hardener 2000 in a ratio of four parts primer surfacer to one part hardener.

Potlife approx. 1 hour at 68°F. Reduce this mixture 15% with XYZ Reducer 3000. Air pressure 55 to 65 lbs at the gun. Apply two single coats, allowing 5 minute flash-off between coats. Can be dry or wet sanded after 45-60 minutes at 68°F. See Material Safety Data Sheet for additional information and applications.

IMPORTANT: Improper spray technique may result in hazardous condition. Follow spray equipment manufacturer's instructions to prevent personal injury or fire. This material is blended with an isocyanate containing additive. Blended materials require all cautions for spraying isocyanates. DO NOT USE IF YOU HAVE CHRONIC (LONG-TERM) LUNG OR BREATHING PROBLEMS, OR IF YOU HAVE EVER HAD A REACTION TO ISOCYANATES. USE ONLY WITH ADEQUATE VENTILATION WHERE OVER-SPRAY IS PRESENT. A POSITIVE PRESSURE AIR SUPPLIED RESPIRATOR (TC19 C NIOSH/MSHA) IS RECOMMENDED. IF NOT AVAILABLE, USE A VAPOR/PARTICULATE RESPIRATOR RECOMMENDED FOR ISOCYANATE VAPORS AND MISTS. Follow directions for respirator use. Wear the respirator for the whole time of spraying and until all vapors and mists are gone. Wear eye and skin protection.

Photochemically reactive

WARNING! FLAMMABLE. VAPOR HARMFUL.

Contains Xylol and/or Toluol, Ester Solvents.
Keep away from heat, sparks, and flame. Eliminate all ignition sources including motors, burners, heaters, pilot lights and static electricity during use and until all vapors are gone. **USE WITH ADEQUATE VENTILATION.** Avoid prolonged or repeated contact with skin and breathing of vapor or spray mists. Do not take internally. Close container after each use.

FIRST AID: If affected by inhalation of vapor or spray mist, remove to fresh air. If breathing difficulty persists or occurs later, consult a physician and have label information available. In case of eye contact, flush immediately with plenty of water for 15 minutes. **CALL A PHYSICIAN.** In case of skin contact, wash thoroughly with soap and water. **CALL A POISON CENTER.** Emergency medical information: (345) 100-1000

KEEP OUT OF THE REACH OF CHILDREN.

*A good label will contain all this information but the law only requires chemical identification, a hazard warning and the name of the manufacturer.

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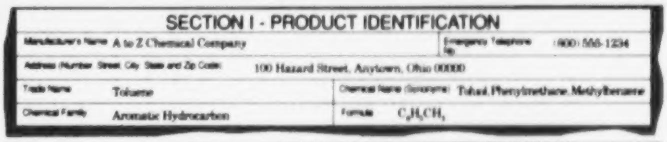
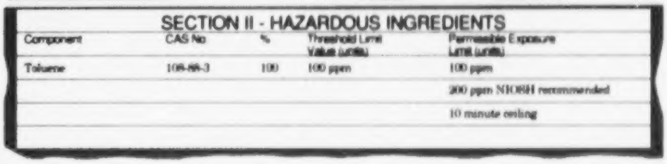
How To Read A Material Safety Data Sheet



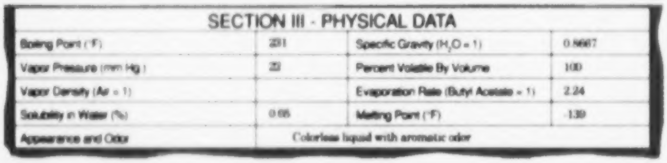
SECTION I - PRODUCT IDENTIFICATION			
Manufacturer's Name	A to Z Chemical Company	Emergency Telephone No.	(800) 555-1234
Address (Number, Street, City, State and Zip Code)	100 Hazard Street, Anytown, Ohio 00000		
Trade Name	Toluene	Chemical Name (Synonyms)	Toluol, Phenylmethane, Methylbenzene
Chemical Family	Aromatic Hydrocarbon	Formula	$C_6H_5CH_3$



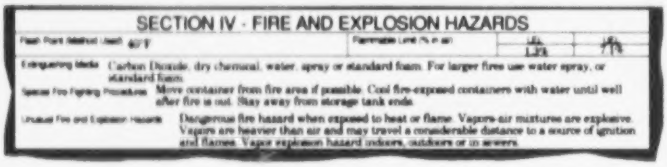
SECTION II - HAZARDOUS INGREDIENTS				
Component	CAS No	%	Threshold Limit Value (units)	Permissible Exposure Limit (units)
Toluene	108-88-3	100	100 ppm	100 ppm
				200 ppm NIOSH recommended
				10 minute ceiling

SECTION I — Product Identification
Identifies the material and its manufacturer.

SECTION II — Hazardous Ingredients
Lists ingredients in the material for which there is a health standard. Standards are listed as a Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL). PEL's are legally enforceable by OSHA. The "skin" notation means the substance is easily absorbed through the skin.



SECTION III - PHYSICAL DATA			
Boiling Point (°F)	231	Specific Gravity (H_2O = 1)	0.8667
Vapor Pressure (mm Hg)	22	Percent Volatile By Volume	100
Vapor Density (Air = 1)		Evaporation Rate (Butyl Acetate = 1)	2.24
Solubility in Water (%)	0.05	Melting Point (°F)	-139
Appearance and Odor	Colorless liquid with aromatic odor		



SECTION IV - FIRE AND EXPLOSION HAZARDS

Flash Point (Method Used) 40°F

Flammable Limit (% in air) LEL 1.27 UEL 7.1

Extinguishing Media: Carbon Dioxide, dry chemical, water, spray or standard foam. For larger fires use water spray, or standard foam.

Special Fire Fighting Procedures: Move container from fire area if possible. Cool fire-exposed containers with water until well after fire is out. Stay away from storage tank ends.

Unusual Fire and Explosion Hazards: Dangerous fire hazard when exposed to heat or flame. Vapors-air mixtures are explosive. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flames. Vapor explosion hazard indoors, outdoors or in sewers.

SECTION III — Physical Data
Lists chemical data — such as boiling point, appearance and odor under normal conditions.

SECTION IV — Fire and Explosion Hazard Data
Gives the flash point of the material — the temperature at which it will catch fire in the presence of a spark or flame. If the flash point is near or below 100°F, the material is dangerous. Hot weather, static electricity or a cigarette can set off a fire or explosion. This section also tells how to put out a fire.

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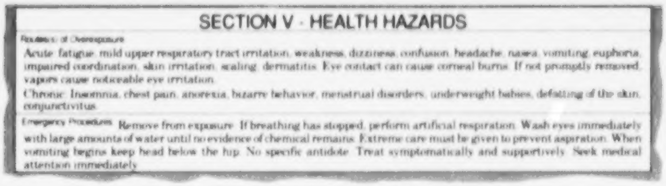
How To Read A Material Safety Data Sheet (continued)



SECTION V - HEALTH HAZARDS

Route(s) of Overexposure

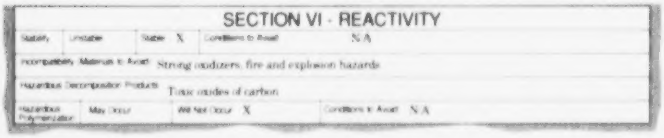
Acute: fatigue, mild upper respiratory tract irritation, weakness, dizziness, confusion, headache, nasea, vomiting, euphoria, impaired coordination, skin irritation, scaling, dermatitis. Eye contact can cause corneal burns. If not promptly removed, vapors cause noticeable eye irritation.

Chronic: Insomnia, chest pain, anorexia, bizarre behavior, menstrual disorders, underweight babies, defatting of the skin, conjunctivitus.

Emergency Procedures: Remove from exposure. If breathing has stopped, perform artificial respiration. Wash eyes immediately with large amounts of water until no evidence of chemical remains. Extreme care must be given to prevent aspiration. When vomiting begins keep head below the hip. No specific antidote. Treat symptomatically and supportively. Seek medical attention immediately.

SECTION V — Health Hazards

Describes health hazards of the chemical including how it enters the body. Short-term (acute) health hazards may be listed, but sometimes long-term (chronic) ones like cancer may not be included.

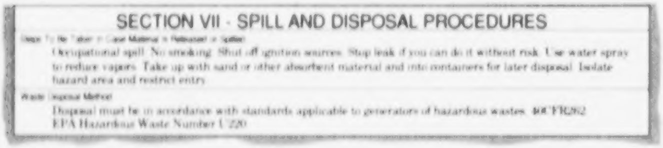


SECTION VI - REACTIVITY

Stability	Unstable	Stable X	Conditions to Avoid N/A
Incompatibility (Materials to Avoid) Strong oxidizers, fire and explosion hazards			
Hazardous Decomposition Products Toxic oxides of carbon			
Hazardous Polymerization	May Occur	Will Not Occur X	Conditions to Avoid N/A

SECTION VI — Reactivity Data

Gives information on conditions that could cause the material to react dangerously or to decompose and release gases and vapors.



SECTION VII - SPILL AND DISPOSAL PROCEDURES

Steps To Be Taken in Case Material is Released or Spilled

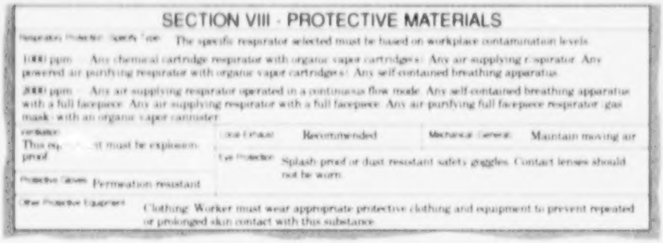
Occupational spill: No smoking. Shut off ignition sources. Stop leak if you can do it without risk. Use water spray to reduce vapors. Take up with sand or other absorbent material and into containers for later disposal. Isolate hazard area and restrict entry.

Waste Disposal Method

Disposal must be in accordance with standards applicable to generators of hazardous wastes. 40CFR262
EPA Hazardous Waste Number U220

SECTION VII — Spill and Disposal Procedures

Describes how to properly clean up spills.



SECTION VIII - PROTECTIVE MATERIALS

Respiratory Protection (Specify Type): The specific respirator selected must be based on workplace contamination levels.

1000 ppm — Any chemical cartridge respirator with organic vapor cartridge(s). Any air supplying respirator. Any powered air purifying respirator with organic vapor cartridge(s). Any self contained breathing apparatus.

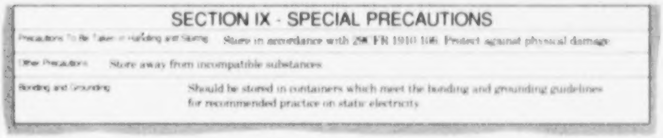
2000 ppm — Any air supplying respirator operated in a continuous flow mode. Any self contained breathing apparatus with a full facepiece. Any air supplying respirator with a full facepiece. Any air purifying full facepiece respirator (gas mask) with an organic vapor cannister.

Ventilation This eq[illegible]t must be explosion-proof	Local Exhaust: Recommended	Mechanical (General): Maintain moving air	
	Eye Protection: Splash-proof or dust resistant safety goggles. Contact lenses should not be worn.		
Protective Gloves: Permeation resistant			

Other Protective Equipment: Clothing: Worker must wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this substance.

SECTION VIII — Protective Measures

Suggests substitutes to use if the chemical is extremely dangerous, describes required engineering controls such as local exhaust ventilation and lists protective equipment and hygiene practices.



SECTION IX - SPECIAL PRECAUTIONS

Precautions To Be Taken in Handling and Storing: Store in accordance with 29CFR 1910.106. Protect against physical damage.

Other Precautions: Store away from incompatible substances.

Bonding and Grounding: Should be stored in containers which meet the bonding and grounding guidelines for recommended practice on static electricity.

SECTION IX — Special Precautions

Describes how to safely handle and store chemicals.

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Sample Material Safety Data Sheet

Material Safety Data Sheet

Date: November 25, 1990

SECTION I - PRODUCT IDENTIFICATION

Manufacturer's Name	A to Z Chemical Company	Emergency Telephone No.	(800) 555-1234
Address (Number, Street, City, State and Zip Code)	100 Hazard Street, Anytown, Ohio 00000		
Trade Name	Toluene	Chemical Name (Synonyms)	Toluol, Phenylmethane, Methylbenzene
Chemical Family	Aromatic Hydrocarbon	Formula	$C_6H_5CH_3$

SECTION II - HAZARDOUS INGREDIENTS

Component	CAS No.	%	Threshold Limit Value (units)	Permissible Exposure Limit (units)
Toluene	108-88-3	100	100 ppm	100 ppm
				200 ppm NIOSH recommended
				10 minute ceiling

SECTION III - PHYSICAL DATA

Boiling Point (°F)	231	Specific Gravity (H_2O = 1)	0.8667
Vapor Pressure (mm Hg.)	22	Percent Volatile By Volume	100
Vapor Density (Air = 1)		Evaporation Rate (Butyl Acetate = 1)	2.24
Solubility in Water (%)	0.05	Melting Point (°F)	-139
Appearance and Odor	Colorless liquid with aromatic odor		

SECTION IV - FIRE AND EXPLOSION HAZARDS

Flash Point (Method Used) 40°F	Flammable Limit (% in air)	LEL 1.3%	UEL 7.1%

Extinguishing Media Carbon Dioxide, dry chemical, water, spray or standard foam. For larger fires use water spray, or standard foam.

Special Fire-Fighting Procedures Move container from fire area if possible. Cool fire-exposed containers with water until well after fire is out. Stay away from storage tank ends.

Unusual Fire and Explosion Hazards Dangerous fire hazard when exposed to heat or flame. Vapors-air mixtures are explosive. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flames. Vapor explosion hazard indoors, outdoors or in sewers.

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Sample Material Safety Data Sheet

SECTION V - HEALTH HAZARDS

Routes(s) of Overexposure

Acute: fatigue, mild upper respiratory tract irritation, weakness, dizziness, confusion, headache, nasea, vomiting, euphoria, impaired coordination, skin irritation, scaling, dermatitis. Eye contact can cause corneal burns. If not promptly removed, vapors cause noticeable eye irritation.

Chronic: Insomnia, chest pain, anorexia, bizarre behavior, menstrual disorders, underweight babies, defatting of the skin, conjunctivitus.

Emergency Procedures Remove from exposure. If breathing has stopped, perform artificial respiration. Wash eyes immediately with large amounts of water until no evidence of chemical remains. Extreme care must be given to prevent aspiration. When vomiting begins keep head below the hip. No specific antidote. Treat symptomatically and supportively. Seek medical attention immediately.

SECTION VI - REACTIVITY

Stability	Unstable	Stable X	Conditions to Avoid N/A

Incompatibility (Materials to Avoid) Strong oxidizers, fire and explosion hazards

Hazardous Decomposition Products Toxic oxides of carbon

Hazardous Polymerization	May Occur	Will Not Occur X	Conditions to Avoid N/A

SECTION VII - SPILL AND DISPOSAL PROCEDURES

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Ventilation This equipment must be explosion-proof.	Local Exhaust Recommended	Mechanical (General) Maintain moving air
Protective Gloves Permeation-resistant	Eye Protection Splash-proof or dust-resistant safety goggles. Contact lenses should not be worn.	

Other Protective Equipment Clothing: Worker must wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this substance.

SECTION IX - SPECIAL PRECAUTIONS

Precautions To Be Taken in Handling and Storing Store in accordance with 29CFR 1910.106. Protect against physical damage.

Other Precautions Store away from incompatible substances.

Bonding and Grounding Should be stored in containers which meet the bonding and grounding guidelines for recommended practice on static electricity.

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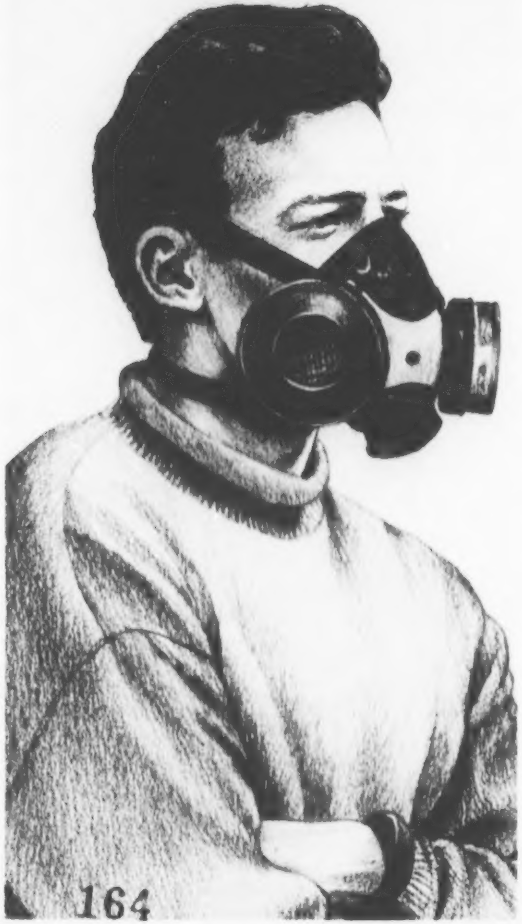
Six Facts You Must Know About Respirators



1. **YOU SHOULD WEAR A RESPIRATOR WHEN:**
   - Your job or task cannot be protected from breathing hazards by using engineering controls such as local exhaust ventilation.
2. **IF YOU HAVE TO USE A RESPIRATOR, IT IS YOUR EMPLOYER'S LEGAL RESPONSIBILITY TO SELECT THE CORRECT TYPE OF RESPIRATOR FOR THE JOB.**
   - Selection is based on the type of breathing hazard a worker needs to be protected against and the amount of exposure.
   - Example: a respirator designed to protect a person from inhaling dust will do nothing to protect him from inhaling solvent vapors.
3. **YOUR RESPIRATOR MUST FIT PROPERLY OR CHEMICALS WILL ENTER THE AIR YOU BREATHE.**
   - Your employer must have a qualified individual fit you for a respirator.
4. **YOUR RESPIRATOR MUST BE PROPERLY CLEANED, STORED AND MAINTAINED OR IT WILL LOSE EFFICIENCY.**
   - Report all problems with your respirator to your supervisor.
5. **THERE ARE TWO TYPES OF RESPIRATORS CURRENTLY IN USE:**
   - Air purifying respirators only remove breathing hazards from the air. They should not be used in work areas where there is not enough oxygen present or in areas where the levels of toxic chemicals present exceed the capacity of the air purifying respirator.
   - Air supplying respirators provide clean air from a noncontaminated source. They must be used in work areas with low oxygen levels and in areas where the levels of toxic chemicals present exceed the capacity of the air purifying respirator.
6. **TO FIND OUT MORE ABOUT RESPIRATOR USE:**
   - Consult the MSDS's (Material Safety Data Sheets) for the chemicals you use.
   - Call 1-800-35-NIOSH (National Institute for Occupational Safety and Health).

Remember: Respirators are the last resort when it comes to controlling job health hazards. NIOSH recommends that respirators be used only when engineering controls are not feasible or effective, while controls are being installed, or in emergencies.

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Attitudes That Help

Here are some attitudes that encourage people to take action or precautions on behalf of health and safety. What others can you think of?

SAFETY
TRAINING

- It is important to speak up for what I believe in.
- I think good safety practices make good business sense. They can cut down on absenteeism, reduce health care costs and increase productivity.
- If I don't watch out for my own health, I can't assume anyone else will.
- My health is very important to me.
- It's worth a small inconvenience to take the necessary precautions.
- I don't care what other people think. If they don't respect my rights, they aren't really my friends.
- I influence my friends and can try to persuade them to do what's right.
- I think it's important to explain safety and health precautions to others.
- I'm prepared to base my job choice on health considerations.

Adapted from "Attitudes That Help and Attitudes That Hinder", TEENAGE HEALTH TEACHING MODULES program, Education Development Center, Inc., Newton, MA.

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Attitudes That Hinder

Here are some attitudes that hinder people from taking actions and precautions on behalf of health and safety. What others can you think of?

- It won't happen to me.
- I'm more careful than other people. ("It won't happen to me").
- It's too awful; I just don't want to think about it.
- I'm a man. You won't catch me acting like that.
- I'm a woman. It just wouldn't be right for me to look like that.
- I just don't want to take the extra time.
- It's too hard to remember all those details; life's complicated enough.
- It's all in the cards. Whatever happens happens. There is nothing I can do about it. It's always been that way.
- I'm not paying attention to what THEY say. They are always setting unnecessary rules and regulations.
- I've got to take the job as it is. I need to eat and can't risk losing my job.

Adapted from "Attitudes That Help and Attitudes That Hinder", TEENAGE HEALTH TEACHING MODULES program, Education Development Center, Inc., Newton, MA.

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What To Do If You Think You Are Being Exposed To A Breathing Hazard At Work

1. **Find out about the hazard.**
    - Consult warning label.
    - Consult MSDS.
    - If still in doubt about a chemical, call the National Institute For Occupational Safety and Health (NIOSH) at 1-800-35-NIOSH. They can answer your questions and also provide you with reference information on specific hazards and control methods.
2. **Find out what's presently being done about the hazard and whether it is appropriate.**
3. **Document any symptoms you are having that you suspect are a result of exposure to the hazard.**
    - Keep records of when they occur and if they go away on weekends or vacations.
    - Ask co-workers if they are having similar symptoms.
    - See a doctor about tests that might be available to determine if overexposure has occured.
4. **Talk to your supervisor, shop steward and/or other company personnel about the problem.**
5. **Contact the health and safety representative for your union, if you are a member of one.**
6. **Seek additional outside help.**
    - You have a right to anonymously request an Occupational Health and Safety Administration (OSHA) inspection of your work area.
    - Contact your union representative or OSHA to find out the procedure.

Future Workers' Education Project • Auto Body and Repair Unit • Handout #11

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Worksheets

Auto Body and Repair

Worksite Smoking Policy

Type of Company: ____________________

Supervisor: ____________________ **Nonsmoker** ________ **Smoker** ________

Purpose of Policy: ____________________

Designated Smoking Permitted Areas Will Be: ____________________

Smoking Will Not Be Permitted In The Following Areas: ____________________

Assistance For Smokers: ____________________

Enforcement: ____________________

Future Workers' Education Project • Auto Body and Repair Unit • Worksheet #1

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Find the Breathing Hazards in the Auto Body Shop

	Breathing hazard/chemical	Clues to recognize exposure (Worker complaints, odor, irritation, fumes)	Methods of Protection (Substitution, ventilation, enclosure, protective equipment, worker habits)
Body repair	*(example)* Welding fumes	*(example)* Flu-like symptoms	*(example)* Local exhaust ventilation hood
Preparing to paint			
Painting and clean-up			

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Find the Breathing Hazards in the Auto Repair Shop

	Breathing hazard/chemical	Clues to recognize exposure (Worker complaints, odor, irritation, fumes)	Methods of Protection (Substitution, ventilation, enclosure, protective equipment, worker habits)
Engine tuning			
Radiator and electrical repair			
Battery repair			
Brake and clutch repair			
Making new parts **Replacing old parts**			

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Chemical Warning Label

Directions: Answer the questions below about the chemical(s) you work with in the auto body and repair shop.

1. What are the names of the chemicals found in this product?

2. What are the physical hazards associated with this product?

3. What are the health hazards associated with this product?

4. What are the first aid instructions

if swallowed?

if inhaled?

in case of contact with skin, etc.?

5. What are the recommendations for safe use?

6. What personal protective equipment is required?

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Material Safety Data Sheet

Directions: Answer the questions below about toluene using the MSDS (Material Safety Data Sheet) for this chemical.

1. What is the PEL for this chemical? ______________________________

In what section did you find this information? ______________________

2. Name three short term health effects caused by inhaling this chemical in excessive amounts.

____

____

____

3. What should be done in the event of a spill or discharge? ______________________

____

____

____

____

In what section did you find this information? ______________________

4. What ventilation equipment is required to keep exposure limits down?

____

____

____

____

5. Is respiratory protection required? ______________________________

____

____

____

____

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Material Safety Data Sheet

(Teacher's Version)

Directions: Answer the questions below about toluene using the MSDS (Material Safety Data Sheet) for this chemical.

1. **What is the PEL for this chemical?** 100 PPM

   In what section did you find this information? Section II

2. **Name three short term health effects caused by inhaling this chemical in excessive amounts.** Fatigue, weakness, confusion, upper respiratory tract irritation, impaired coordination.

3. **What should be done in the event of a spill or discharge?** Shut off ignition sources. Use water spray to reduce vapors. Isolate hazard area and restrict entry.

   In what section did you find this information? Section VII

4. **What ventilation equipment is required to keep exposure limits down?** General or local exhaust ventilation that meets TLV requirements.

5. **Is respiratory protection required?** No, not if adequate ventilation exists and exposure remains at or below the PEL. If exposure is above the PEL, respirator selection is based on contamination levels.

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Scenario One

You are a member of the shop safety and health committee. You have been asked to respond to a worker who made the following statement.

"The dangers of chemicals at work are overstated. If you use your nose to warn you and are careful not to breathe too much of the stuff, it can't do too much harm. Anyway, I've been working with this stuff for 20 years and I'm okay."

In small groups evaluate the statement and prepare a brief response for this worker.

What would you say to this worker?

1. ______________________________

2. ______________________________

3. ______________________________

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Scenario One

(Teacher's Version)

You are a member of the shop safety and health committee. You have been asked to respond to a worker who made the following statement.

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In small groups evaluate the statement and prepare a brief response for this worker.

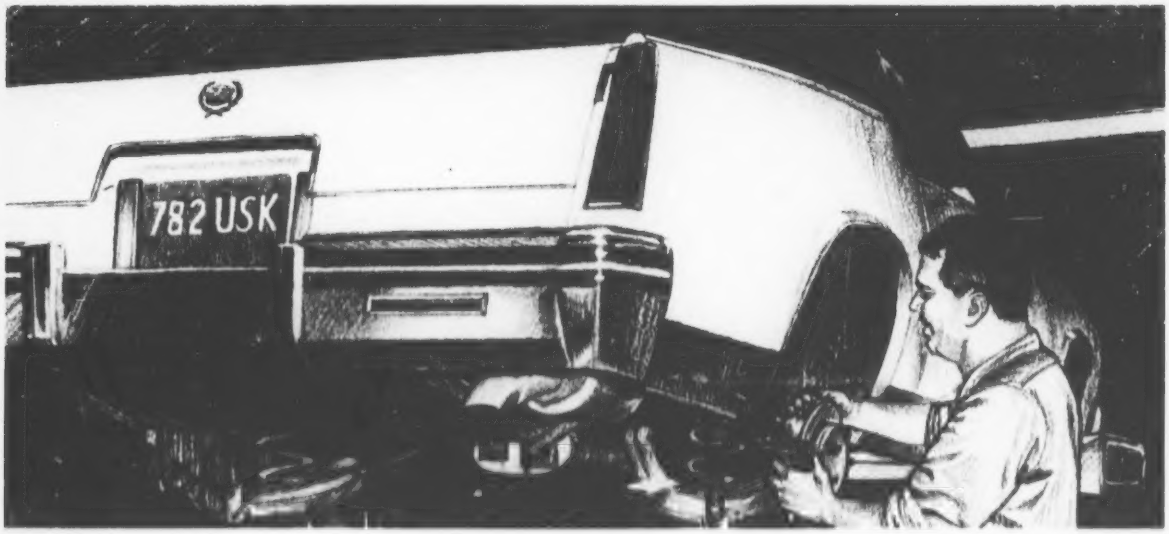
What would you say to this worker?

1. You can't always rely on your nose to warn you about toxic exposures. Some chemicals are odorless. Other chemicals can only be detected at levels high enough that your health is already being harmed. And lastly, your nose can sometimes get accustomed to some chemical smells so that after a while you no longer smell even strong odors.

2. Without proper ventilation or adequate respiratory protection, you can breathe these chemicals. Once you breathe them in, they can be carried through your bloodstream causing damage to other organs in your body.

3. Some cancer causing substances like asbestos, can take as long as 20 to 30 years from initial exposure until health damage shows up. This lag time is known as a latency period. It's important to reduce your exposure to toxic substances as low as possible because scientists know that lowering the amount of exposure lowers your risk of getting sick.

Scenario Two



Vince Vitaglio works as an auto mechanic at Pettiford's Auto Repair. Most of his work has been confined to engine tuning and repair, but today his supervisor has asked him to do a brake job that requires the handling of asbestos parts. He has been asked to work on the brakes using compressed air to remove the asbestos dust.

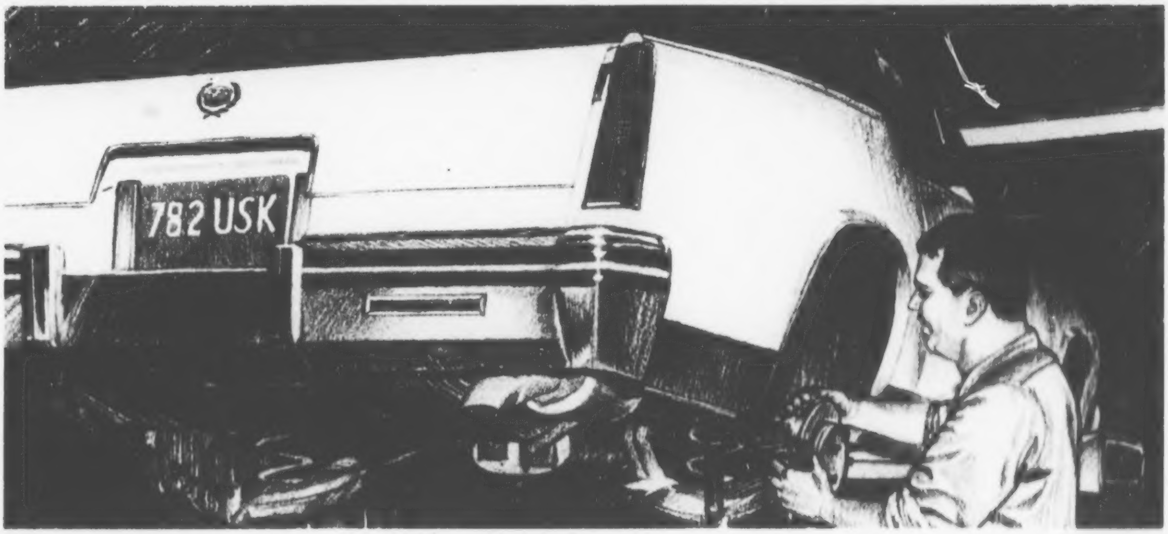
What controls that are in place do you feel are proper? Why? ______

What would be the correct way to do this job? ______

180

Scenario Two

(Teacher's Version)



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What controls that are in place do you feel are proper? Why? No controls in place. He has not been given any protection. This is totally inadequate when working with a cancer-causing substance like asbestos.

What would be the correct way to do this job? Use high-efficiency particulate air (HEPA) vacuum when working on asbestos-containing brakes and clutches. Where a HEPA vacuum is unavailable, use an air supplying respirator with airline hose or powered air-purifying respirator with a high-efficiency particulate filter approved for asbestos.

Never use compressed air to clean brakes and clutches. Using compressed air to remove the asbestos is a serious hazard and violates OSHA requirements.

For clean up use a wet mop. Never dry sweep.

Wear a disposable suit to avoid taking asbestos home.

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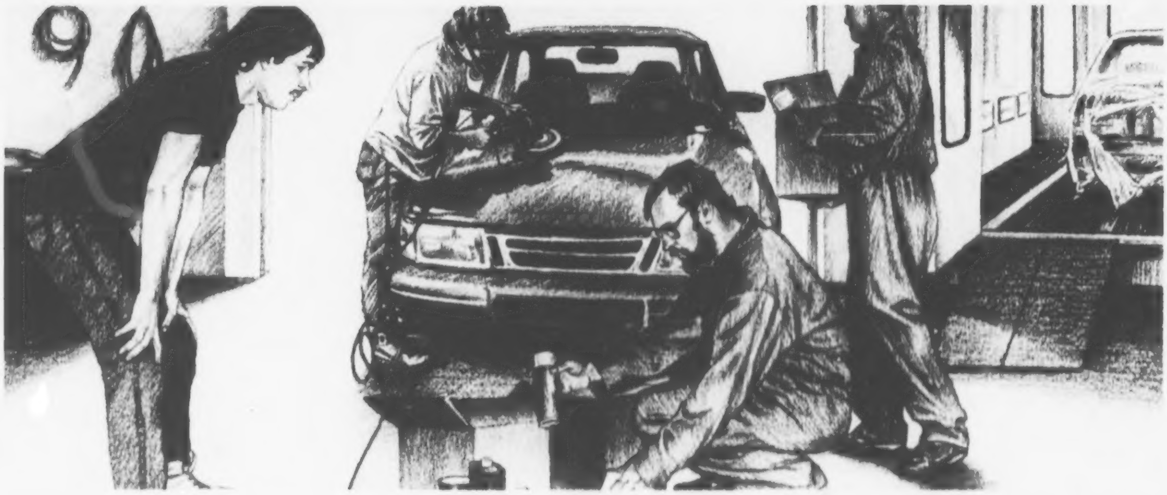
Scenario Three



Mike Santana works in the painting area at a major automotive repair shop. The shop services and repairs American-made cars. It contains state-of-the-art safety features such as downflow paint room, spray booth, prep station, spray walls and dustless vacuuming and sanding equipment. The painting area has just received a large shipment of new solvents to replace the present ones which are very toxic. The boxes arrive unopened and Mike's co-worker begins to unbox and use them to finish a rush job he's been working on.

What is unsafe about the way Mike and his co-workers are doing their jobs?

Where can Mike and his co-workers get more information about the chemicals on the job?

What kind of training and information about chemicals on the job must be provided by the employer? What law requires this?

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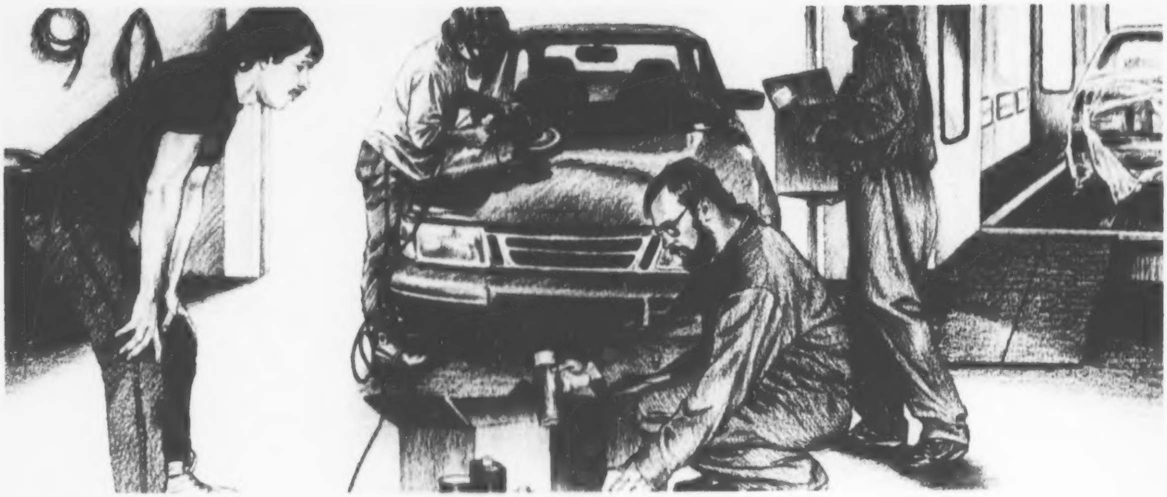
Scenario Three

(Teacher's Version)



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What is unsafe about the way Mike and his co-workers are doing their jobs? Using chemicals without knowing about health effects. Also, not being trained in safe work practices, and proper protections. (Workers should be wearing safety shoes and safety glasses. Electrical cord should not be on the floor.)

Where can Mike and his co-workers get more information about the chemicals on the job? From the Material Safety Data Sheets and labels.

What kind of training and information about chemicals on the job must be provided by the employer? What law requires this? The OSHA Hazard Communication Standard requires that employers:

1. maintain a list of all chemicals used on the job and keep Material Safety Data Sheets for these chemicals. These MSDSs must be readily available to all workers.
2. provide training to all workers about the chemicals they are working with and each time a new chemical is introduced into the shop. Training should occur annually and for new workers.
3. labelling of all hazardous chemicals.

Scenario Four

Kevin Wagner has been working as an auto mechanic at Rempel's Auto Repair for over a year. During the last six months, he has noticed that three of his co-workers have become nauseous and dizzy during working hours and better on the weekends. This week Kevin started to develop the same symptoms.

What are the problems Kevin is facing?

Where can he find information to help him solve these problems?

If you were Kevin, what three things would you do to solve these problems?

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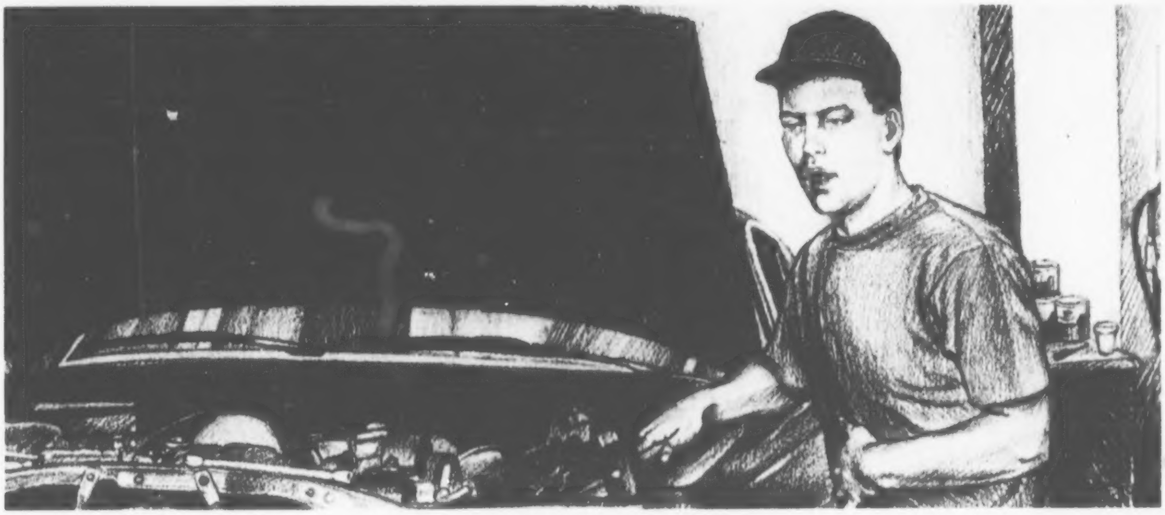
Scenario Four

(Teacher's Version)



Kevin Wagner has been working as an auto mechanic at Rempel's Auto Repair for over a year. During the last six months, he has noticed that three of his co-workers have become nauseous and dizzy during working hours and better on the weekends. This week Kevin started to develop the same symptoms.

What are the problems Kevin is facing?

Possible worksite over-exposure to a toxic substance. Possible faulty or insufficient ventilation system.

Where can he find information to help him solve these problems?

Chemical warning labels

Material Safety Data Sheets

Through your union you can ask an industrial hygienist or a medical evaluator

If you were Kevin, what three things would you do to solve these problems?

Document symptoms

Compare symptoms with information on chemical warning labels and the MSDS

Seek medical attention

Speak to your supervisor or union representative

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Transparencies

Auto Body and Repair

Federal Hazard Communication Standard (HazCom)

The Federal Hazard Communication Standard gives workers the legal right to training about:

1. The chemical ingredients in each product and not just the trade name
2. Health effects
3. Safe work practices, protective equipment and ventilation required
4. Symptoms of overexposure
5. Emergency procedures and treatment
6. Flammability and chemical reactivity information

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Additional Worker Rights

Your employer must also provide you with:

1. A written copy of the shop's Hazard Communications Program (HazCom)
2. A complete list of the hazardous substances used in the shop
3. Material Safety Data Sheets for all hazardous substances that you are exposed to at work
4. A copy of their medical records
5. All company monitoring data for all substances
6. Finally, you should know that you have the legal right to call OSHA to inspect a workplace without revealing your name

Future Workers' Education Project • Auto Body and Repair Unit • Transparency #2

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